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INSTALLATION RESTORATION PROGRAM

PHASE I: RECORDS SEARCH

PLATTSBURGH AFB, NEW YORK

Prepared by:

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This report identified and evaluated several potentially hazardous waste disposal sites at Plattsburgh AFB. Records of past waste handling and disposal practices were reviewed. Interviews with past and present installation employees were conducted to develop a history of waste disposal practices. The environmental setting for effectively receiving the wastes was evaluated including soils geology, groundwater and surface water. Nine fuel and/or solvent spills, a fire training area, a landfill, and two storage areas were found to have potential to create environmental contamination and follow-on investigations (Phase II) were recommended and outlined.

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TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

A. BACKGROUND

1. Radian Corporation was retained on 24 May 1984 to conduct the Plattsburgh Air Force Base (AFB) Installation Restoration Program Phase I Records Search under Contract No. F08637 83 G0008 5002, with funds provided by the United States Air Force.

2. Defense Environmental Quality Program Policy Memorandum (DEQPPM) 81-5 explains the Department of Defense (DOD) DOD policy, which is to identify and fully evaluate suspected problems associated with past hazardous waste management practices on DOD facilities and to control the migration of hazardous constituents that could endanger health and welfare.

3. To implement the DOD policy, a four-phase Installation Restoration Program (IRP) has been directed. Phase I, the records search, is the identification of potential problems. Phase II, if required, (not part of this contract) consists of follow-on field work to determine the extent and magnitude of contaminant migration. Phase III, if required (not part of this contract) consists of technology development (research and development effort only when required). Phase IV, if required (not part of this contract), is the development and implementation of selected remedial actions.

4. The Plattsburgh AFB Phase I Records Search included a detailed review of pertinent installation records, contacts with eight representatives of local and regional regulatory agencies, and an on-site visit conducted by Radian 5-9 November 1984. The records search also included five additional sites which are not contiguous with Plattsburgh AFB. These USAF owned sites are the

TACAN aerial navigation site, Middle Marker visual landing approach site, ILS Marker Beacon site, Annex #1 remote communications receiver site, and the remote communications transmitter site. During the base visit, interviews were conducted with 31 past and present installation employees and a ground tour of installation facilities and identified sites of potential environmental contamination was accomplished.

B. MAJOR FINDINGS

1. Since 1955, hazardous and potentially hazardous wastes have been generated by industrial shop operations at Plattsburgh AFB. No information was available on activities prior to 1955. Waste oils, fuels, solvents, paint residues, etc., generally have been stored on-site at the various shops until disposed of or recycled by a hazardous waste contractor. Small quantities of wastes have been spilled around hazardous waste accumulation sites and flowed to the ground. Spills inside shops have either been contained and cleaned up or washed down floor drains in shops that have oil/water separators. Hazardous wastes at Plattsburgh AFB have not routinely been disposed of by landfilling or incineration. Currently, some hazardous wastes are recycled whenever possible, or disposed of off-base by contractors through the Defense Property Disposal Office (DPDO).

2. Fire training exercises have provided a means of disposal for waste fuels, oils, and miscellaneous combustible materials since the late 1950s. In 1980, one of the three fire training pits was deactivated while the remaining two were sealed with a bentonite liner to prevent percolation into the ground. The three fire pits are in the same area and fire training has been carried out there since base operations began.

3. Landfills have been used for waste disposal since 1955. The materials disposed of have been domestic and construction wastes. Four landfill sites for domestic wastes were identified; three of these allowed burning of trash. None are presently active as base trash has been contract-hauled off-site since 1979. One active construction spoils site was identified, and two munitions disposal sites are currently operated.

4. Three surface drainage streams, the Weapons Storage Area (WSA) drainage to the Salmon River, the POL and housing area drainage to Lake Champlain, and the golf course streams and ponds draining to Lake Champlain, were identified on base. These streams have year-round flow, and in addition drain stormwater from large portions of the base. Surface water sampling has occasionally identified contamination in these streams. Concentrations have been in the microgram per liter range. However, these streams are not used as sources of commercial or industrial water supply. Base water is purchased from the City of Plattsburgh.

5. There are 57 fuel storage tanks and 235 heating oil tanks currently active on the installation. Two spills involving heating oil tanks were reported.

6. There are 10 hazardous materials accumulation points on Plattsburgh AFB. Accidental spillage was reported at two of these sites.

7. Thirteen spill sites were identified throughout the base. JP-4 spills have occurred on the flightline ramp. Other spills involved heating fuel oil, engine oil, and PCB-contaminated transformer fluid. Spills inside shops have been either contained and cleaned up or washed down the floor drains in shops that have oil/water separators.

C. CONCLUSIONS

1. Review of the comprehensive data base assembled for the Phase I study resulted in ranking 13 sites using the Hazardous Assessment Rating Methodology (HARM) based on their potential for migration of hazardous constituents.

2. Figure 1 presents the locations of the 13 HARM-rated sites.

3. Table 1 presents the 13 HARM-rated sites with their final HARM scores, and their potential risk rating.

D. RECOMMENDATIONS

1. Phase II sampling and analysis of surface water, ground water, pond sediment, and soil boring samples is recommended at the six sites identified as having a high potential risk.

2. Limited Phase II sampling and analysis of soil boring samples is recommended at two other sites identified as having a moderate potential risk.

3. No Phase II activities are recommended for five sites identified as having a low potential risk and nine sites not rated using the HARM model.

4. A total of three surface water sampling locations, 22 ground water monitoring well locations, five pond sediment sampling locations, and eight soil boring locations are recommended. These should be sufficient to detect the presence and/or migration of contaminants on the base.

TABLE 1. POTENTIAL RISK RANKING BASED ON FINAL HARM SCORES

Site Number	Description	Final HARM Score	Potential Risk
SP-3	JP-4 and solvent spills, SAC Flightline, Ramp and Adjacent Industrial Area	79	High
SP-8	Fuel spills, POL Storage Area	77	
SP-9	Solvent spills, MMS Industrial Complex	70	
SP-10	JP-4 spills, Alert Area	68	
FT-1	Fire Training Area	66	
D-4	Landfill, south of Fire Training Area	62	
SP-6	JP-4 spills, AF Vehicle Maintenance Building 2542	56	Moderate
SP-2	Number 2 heating fuel spill, Building 205	54	
SP-12	New Product Drum Storage Area, outside NW corner of Building 2890	52	Low
SP-11	Engine oil spills, New Base Housing Area	51	
SP-7	Number 2 fuel oil spill, behind DPDO Office	50	
SP-5	JP-4 spill, Isolation Valve Pit SE of Flightline Ramp	50	
SP-13	New and Spent Product Drum Accumulation Area, outside SE corner of Building 2774	48	

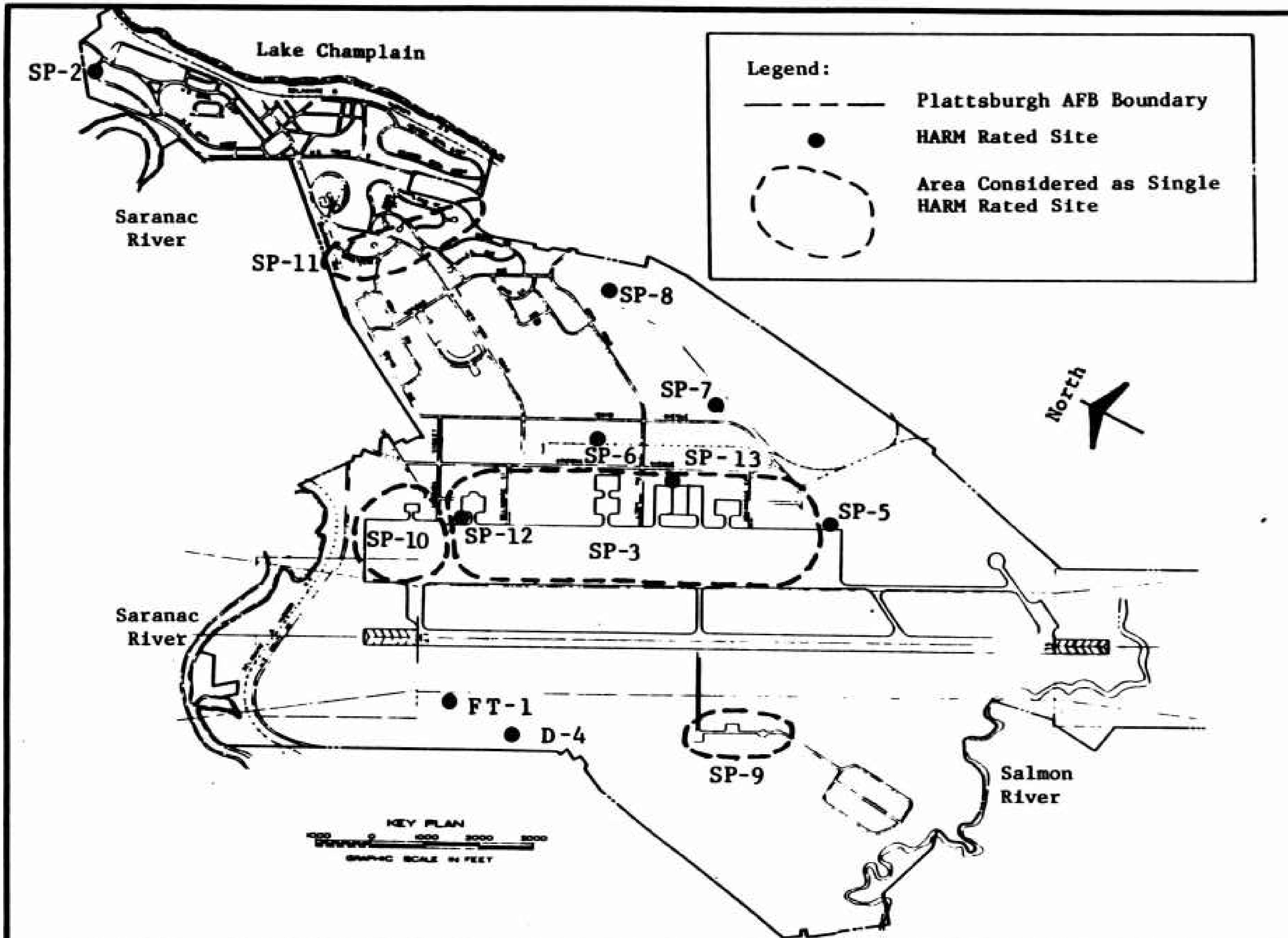


Figure 1. Locations of HARM Rated Sites, Plattsburgh AFB, New York

5. Figure 2 presents the locations of recommended sampling sites.

6. It is recommended that all of the samples be analyzed for volatile organics and semi-volatile organics. In addition, the surface water and ground water samples should be analyzed for oil and grease and total organic carbon (TOC).

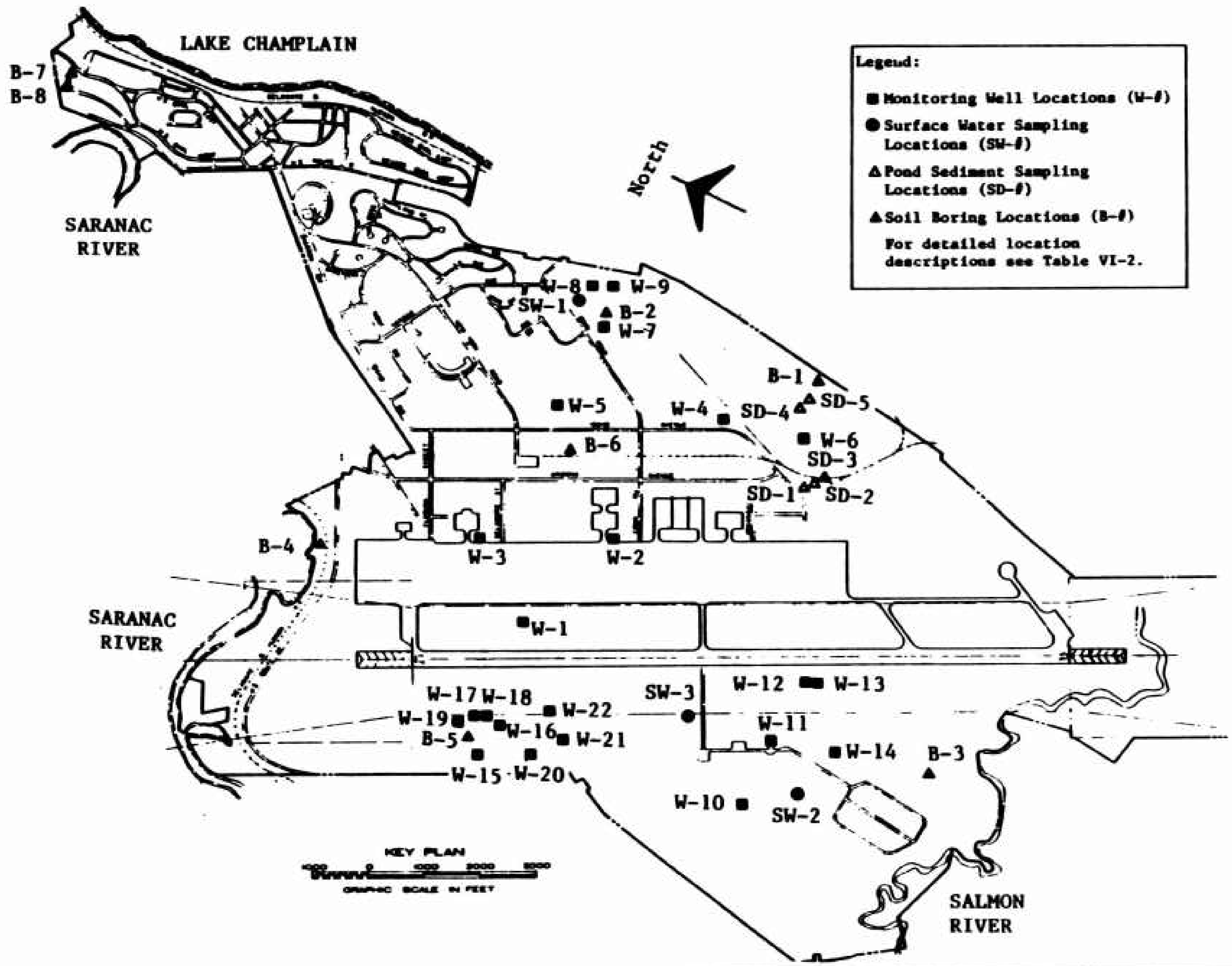


Figure 2. Recommended Sample Collection Locations at Plattsburgh AFB, New York

I. INTRODUCTION

A. Background

The United States Air Force has long been engaged in a wide variety of operations dealing with toxic and hazardous materials. Federal, state, and local governments have developed strict regulations which require disposers to identify the locations and contents of disposal sites and to take action to eliminate the hazards in an environmentally responsible manner. The primary federal legislation governing disposal of hazardous waste is the Resource Conservation and Recovery Act (RCRA) of 1976, as amended. Under Sections 6003 and 3012 of the Act, Federal agencies are directed to assist the Environmental Protection Agency (EPA) and state agencies to inventory past disposal sites and make the information available to the requesting agencies. The Department of Defense (DOD) Installation Restoration Program (IRP) assures compliance with these hazardous waste regulations. The current DOD IRP policy is contained in Defense Environmental Quality Program Policy Memorandum (DEQPPM) 81-5, dated 11 December 1981 and implemented by Air Force message dated 21 January 1982. DEQPPM 81-5 reissued and amplified all previous directives and memoranda on the IRP. DOD policy is to identify and fully evaluate suspected problems associated with past hazardous contamination, and to control hazards to health and welfare that resulted from these past operations. The IRP is the basis for response actions on Air Force installations under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as clarified by Executive Order 12316 and 40 CFR 300 Subpart F (National Contingency Plan). CERCLA is the primary legislation governing remedial action at past hazardous waste disposal sites.

Radian Corporation was retained on 24 May 1984 under Contract No. F08637 83 G0008 5002 to conduct the IRP Hazardous Materials Disposal Sites Records Search for the Plattsburgh Air Force Base (AFB) Installation.

There are four phases to the IRP. The records search comprises Phase I. During this phase, installation records are reviewed to identify possible hazardous waste-contaminated sites and to assess the potential for contaminant migration. Only Phase I activities are covered in this report. Phase II of the IRP consists of follow-on field work to determine the extent and magnitude of contaminant migration. Phase III consists of technology development (R&D effort only when necessary). Phase IV includes the development and implementation of a remedial action plan.

B. Purpose

The purpose of the Phase I records search is to identify past hazardous materials disposal and spill sites and assess the potential for contaminant migration from these sites. The existence of and potential for migration of hazardous contaminants were evaluated at Plattsburgh AFB by reviewing Air Force supplied data, technical reports, and conducting interviews with past and present base personnel and regulatory officials familiar with Plattsburgh AFB. This report addresses the history of operations, the geological and hydrogeological conditions which may directly influence migration potential, and the ecological setting of the facility.

This Phase I records search also covers five additional sites which are not contiguous with Plattsburgh AFB. These USAF owned sites are the TACAN aerial navigation site, Middle Marker visual landing approach site, ILS Marker Beacon site, Annex #1 remote communications receiver site, and the remote communications transmitter site.

C. Scope

Phase I activities included:

- Reviewing site records;
- Interviewing personnel familiar with past generation and disposal activities;
- Compiling an inventory of wastes;

- Determining waste quantities and locations of current and past hazardous waste storage, treatment and disposal;
- Defining the environmental setting at Plattsburgh AFB;
- Reviewing past disposal practices and methods;
- A helicopter overflight of Plattsburgh AFB;
- Gathering information from state, local and federal agencies;
- Assessing the potential for contaminant migration; and
- Recommending follow-on activities if required.

The pre-performance meeting was held at Plattsburgh AFB on 7 September 1984. Representatives of the Air Force Engineering and Services Center (AFESC), Strategic Air Command (SAC), Plattsburgh Air Force Base, and Radian attended the meeting. The purpose of the pre-performance meeting was to provide detailed project instruction to the Radian project team. The AFESC and SAC representatives provided clarification and technical guidance and defined the responsibilities of all parties participating in the Plattsburgh AFB Records Search.

The on-site installation visit was conducted by three Radian technical staff members from 5 November through 9 November 1984. Activities performed during the on-site visit included a detailed search of installation records, ground tour and helicopter overflight of Plattsburgh AFB, and interviews with past and present base personnel. The following individuals comprised the entire Radian Phase I Records Search team:

1. Francis J. Smith, P.E., Program Manager, M.S. Sanitary Engineering;
2. Michael A. Zapkin, Project Director, M. Eng. Environmental Engineering and M.S. Biology - Team Chief and Ecologist;
3. Andrew M. Oven, M.S. Environmental Engineering - Hydrogeologist and Environmental Engineer; and
4. Lori L. Stoll, M.S. Chemical Engineering - Chemical Engineer.

Resumes of team members are included in Appendix A.

The principal Air Force representative who assisted in the Plattsburgh AFB study is the base Environmental Coordinator (Installation Point of Contact). Additional base personnel who provided support include one of the Civil Engineers and the Environmental Planner.

D. Methodology

The methodology for the Plattsburgh AFB records search is shown graphically in Figure I-1. The first step was a review of past and present industrial operations. This allowed the identification of waste stream contents and quantities. Information was obtained from records such as the Tab A-1 Environmental Narrative, oil/water separator inventory, spill prevention plan, CE annual pollution discharge estimates, hazardous waste management plan, and available analytical data.

The second step was to define and evaluate current and past management practices regarding the use, storage, treatment, and disposal of hazardous materials from the industrial operations identified in Step 1. At this stage, sites of active and former landfills, storage areas and tanks were identified. Other potentially contaminated sites, such as the locations of spills of waste oils, solvents, and fuels were identified.

The Records Search team conducted a detailed ground tour and an overflight of the base. The team looked for any evidence of environmental impact, such as vegetation stress or disrupted topography. It was during this on-site visit that interviews with past and current base employees occurred. A list of interviewees and outside agency contacts is presented in Appendix B.

At this time a number of decisions were made. The first decision pertained to the potential for contamination of each site. If it was determined that the site was potentially contaminated, then the potential for migration of hazardous constituents from the site was evaluated. The site was rated using the Air Force Hazard Assessment Rating Methodology (HARM). This

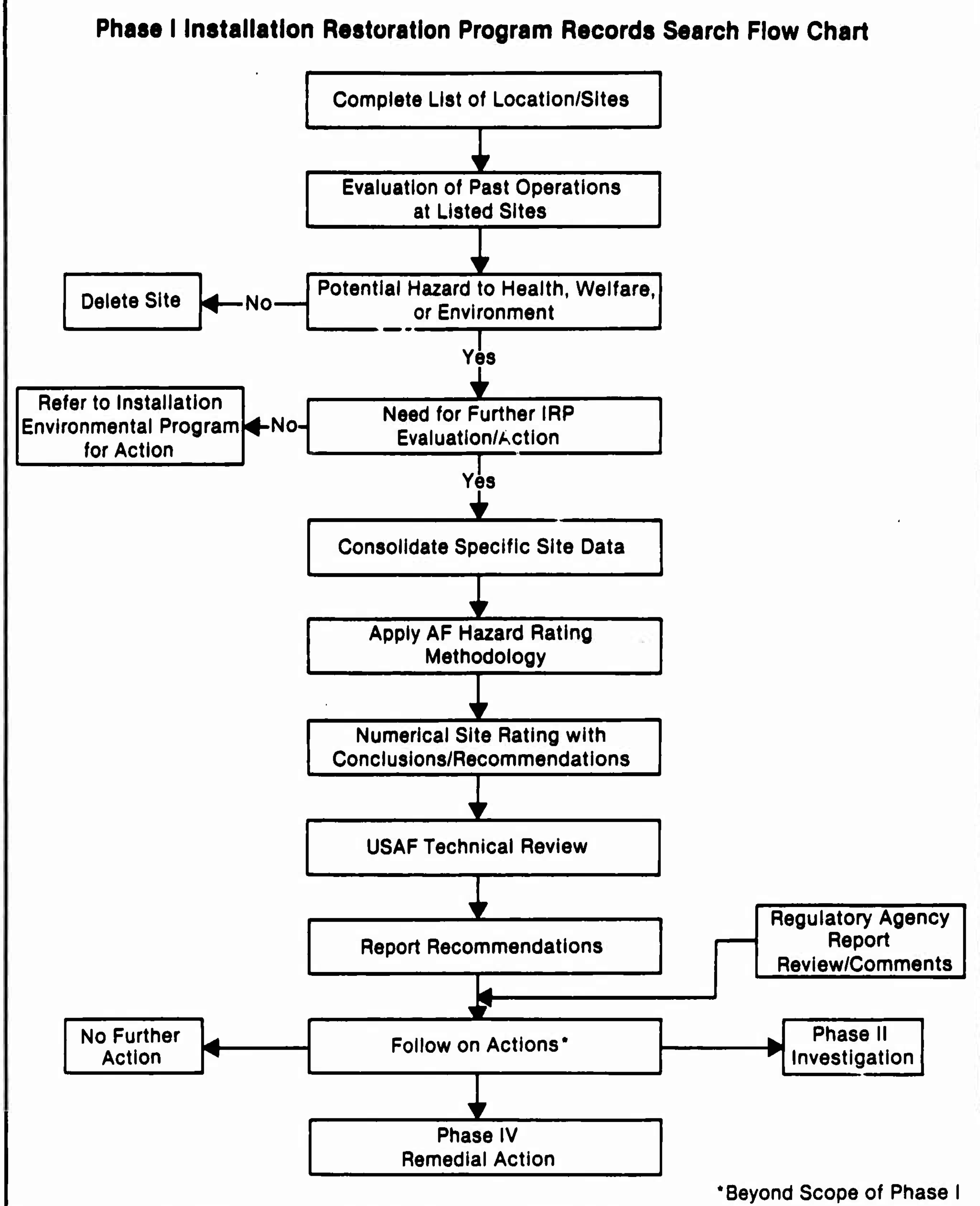


Figure I-1. Installation Restoration Program Phase I Decision Tree.

rating system results in a single score for each site which is based on evaluation of factors such as waste type and quantity, receptors, and pathways. This allows the relative ranking of sites with different environmental settings and waste characteristics. Based on the hazard ratings, recommendations for follow-on activities were developed. Recommendations vary from no action to a complete monitoring and sampling program for those sites receiving a high HARM score. A limited Phase II program may be recommended for sites receiving a moderate HARM rating to confirm that hazardous materials are not migrating from the site. The site rating methodology is described in Appendix C.

II. INSTALLATION DESCRIPTION

A. Location, Size, and Boundaries

Plattsburgh Air Force Base is located in the northeastern corner of New York State in Clinton County. The base is bordered on the north by the City of Plattsburgh. The Town of Plattsburgh is west and south of the base, and Lake Champlain is located to the east. The Town of Plattsburgh and the City of Plattsburgh are generally referred to together as "Plattsburgh." The base is approximately 26 miles south of the Canadian border and 64 miles south of Montreal, Canada. Albany, New York is 167 miles south of Plattsburgh. Figure II-1 shows the location of Plattsburgh within the state of New York.

Plattsburgh AFB covers 4,795 acres in eastern central Clinton County, as shown in Figure II-2. Federally owned, military controlled land constitutes 3,365 acres, while 1,430 acres of the land are registered as easement tracts. The layout of the base is shown in Figure II-3.

Approximately half of the land use in Clinton County is dedicated to forest resources, including the generation of forest products, watershed protection, and recreation. Agriculture accounts for 15.1 percent of land use and residential, industrial, and commercial uses make up approximately 1.2 percent of the land use in the county.

B. Organization and Mission Summary

1. Base History

The U.S. Government has maintained a military facility at Plattsburgh, New York since 1812. The first facility was known as "Pike's Cantonment" and consisted of approximately 200 log huts located on the south bank of the Saranac River near its mouth. The 6th, 15th, and 16th regiments of the first brigade of the Northern Army of the United States commanded by Colonel Zebulon Pike were quartered at the site during the winter of

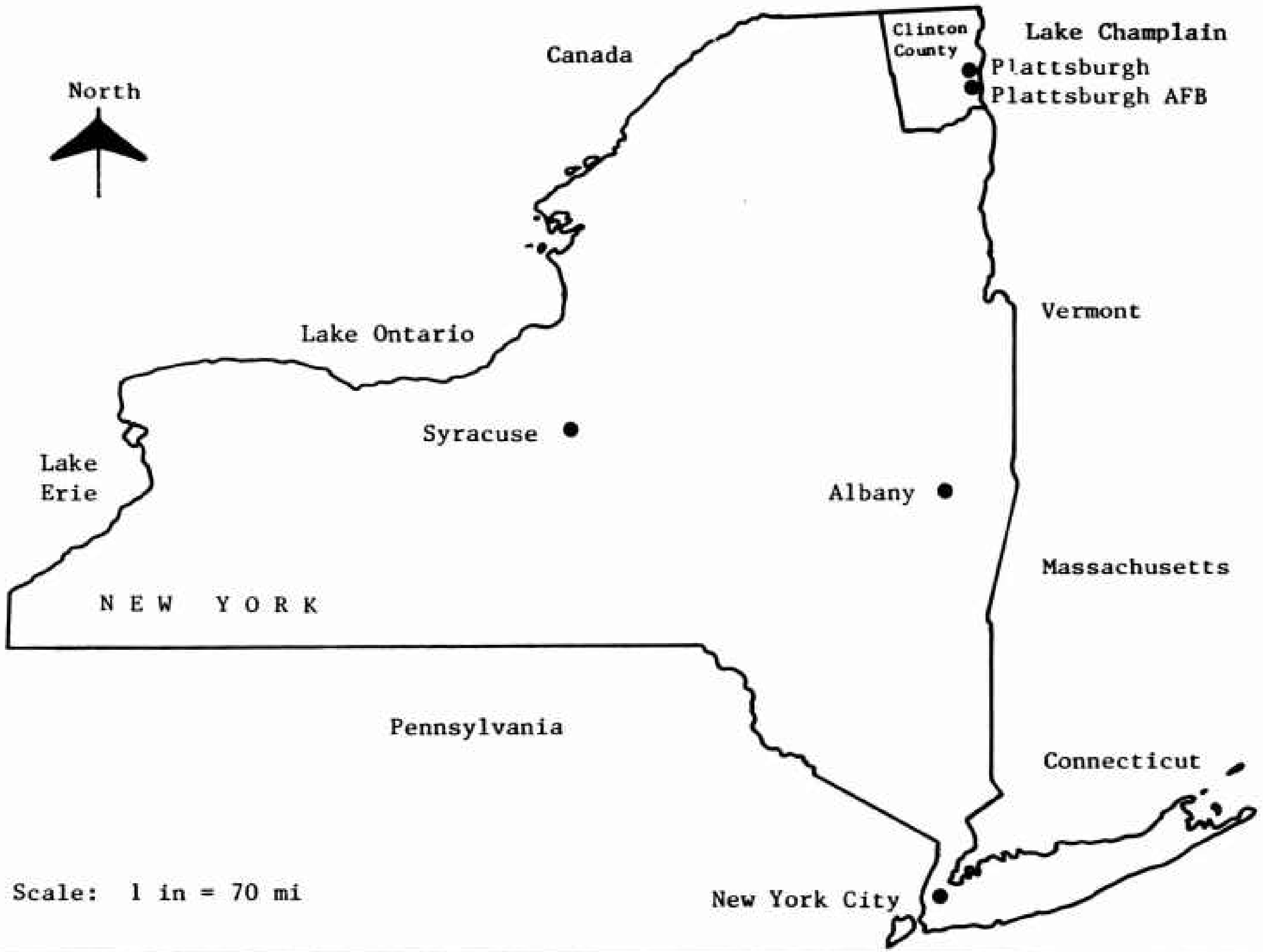


Figure II-1. Location of Plattsburgh Air Force Base in State of New York

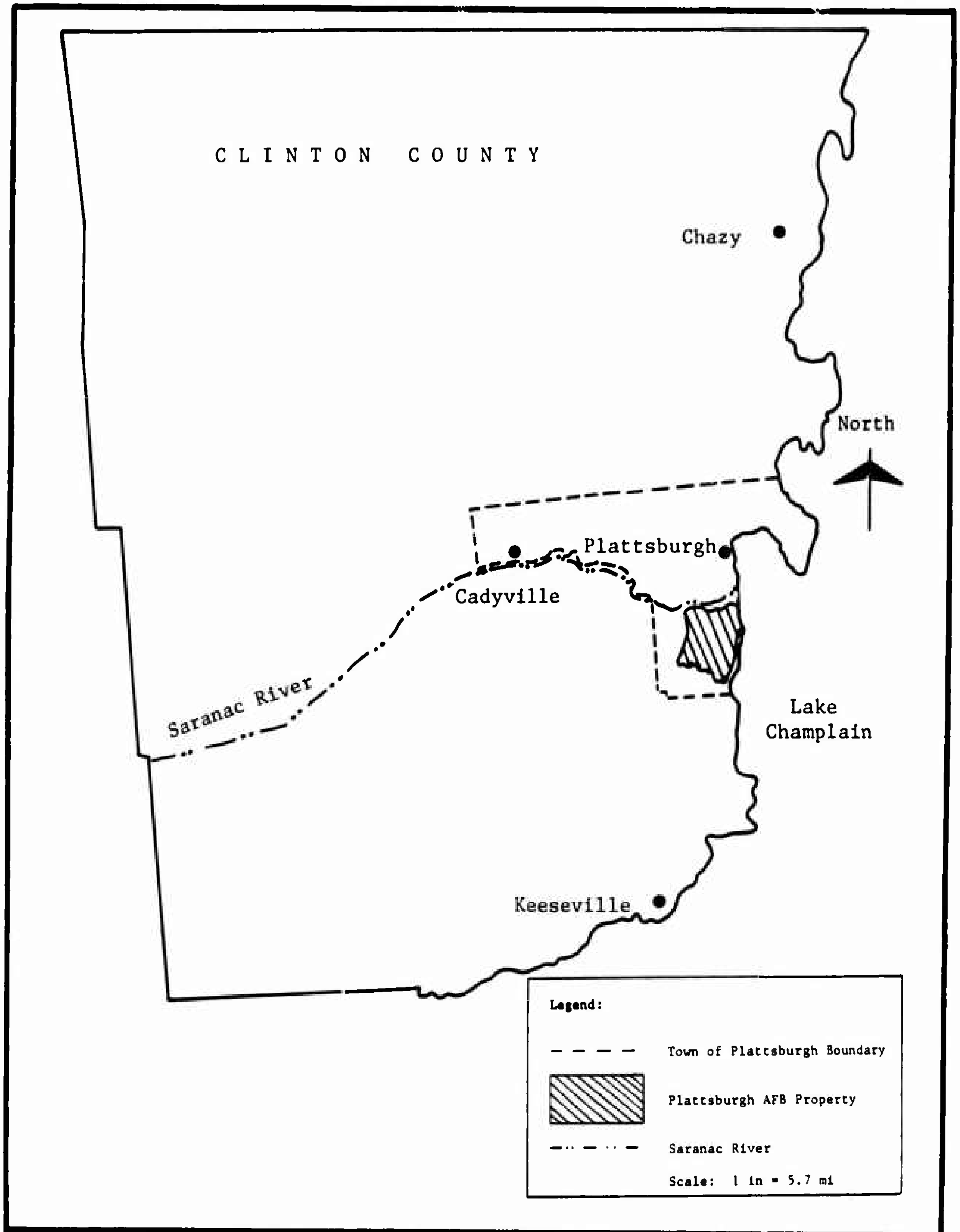
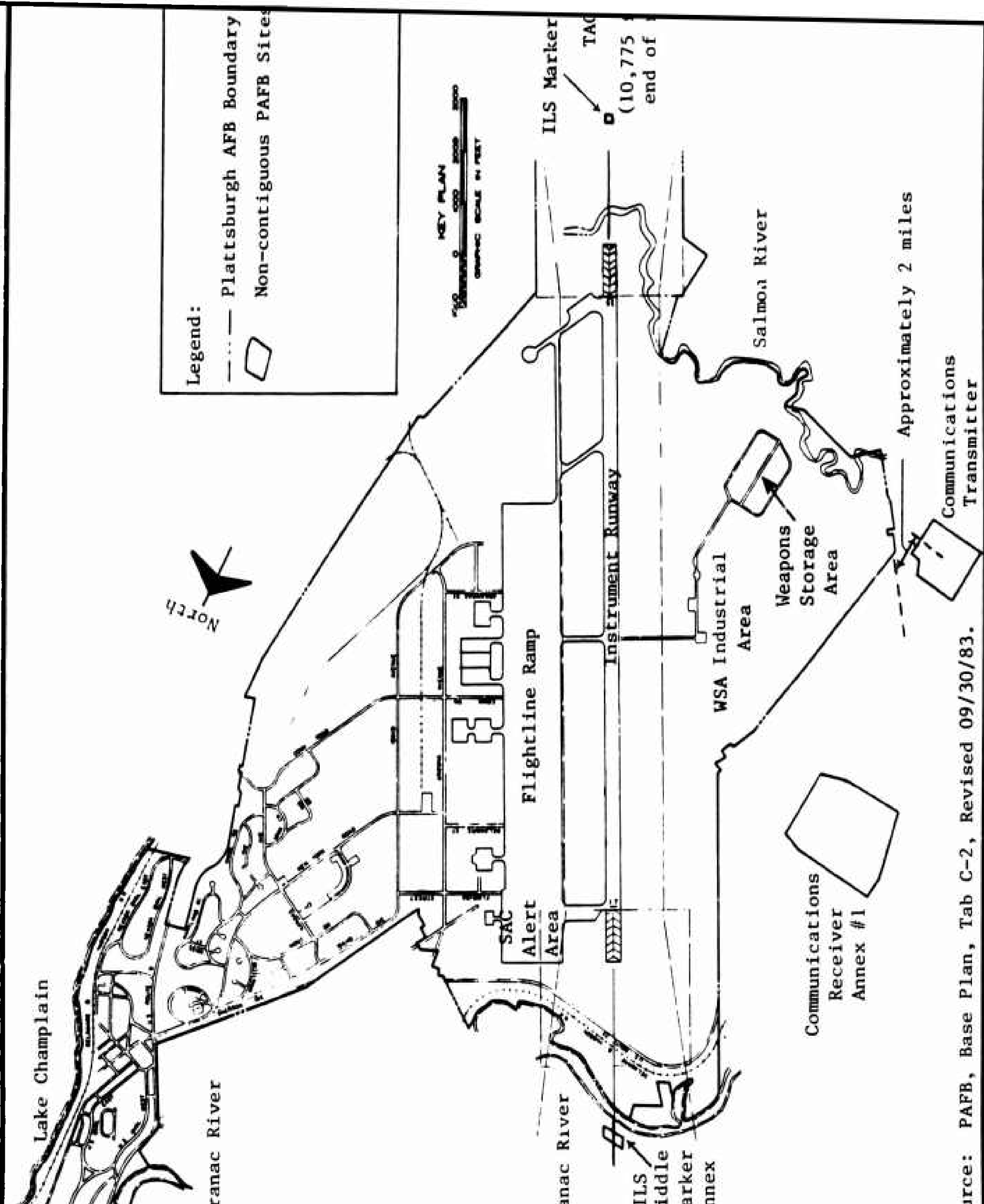


Figure II-2. Clinton County and Plattsburgh AFB Location



Source: PAFB, Base Plan, Tab C-2, Revised 09/30/83.

Figure II-3. General Layout of Plattsburgh AFB, New York

1812-1813. These forces made a short attack across the Canadian line and then fell back to Plattsburgh, where they spent the winter. On 4 March 1813, Colonel Pike and his troops left the camp for Sackets Harbor. Five months after departure, British troops raided Plattsburgh and burned the camp. The area was later recaptured by the American forces.

On 30 December 1814, the U.S. Government purchased 200 acres of land just south of Plattsburgh for the establishment of a military reservation. More land was added to the reservation from time to time. Immediately prior to abandonment as an army post in 1944, the reservation contained 727 acres.

The first permanent structures were erected between 1838 and 1842 and consisted of officers' and soldiers' quarters built of native limestone. Between 1868-1879, several wooden buildings were constructed for troop housing. During 1894-1897 barracks for officers and soldiers were constructed from brick made in the area. Building 625, constructed in 1838, was placed on the National Register of Historic Places in February 1971. This building was included along with the cemetary, Buildings #631, 666, and 742, and 7.13 acres of land, and declared excess by HQ USAF. Currently these buildings are being processed for sale or transfer to a Governmental Agency with a restriction that they be used for historical museum purposes only.

In 1915, the first of the Civilian Military Training Camps was opened at Plattsburgh, New York. This was the first time that an attempt was made to complete the essential training required for an officer of the line in a three month period. Known as the Plattsburgh Idea, this method of training was promoted by Major General Leonard P. Wood and proved very successful.

In March, 1944, the Post was turned over to the United States Navy which operated it as a training station until 1 January 1945. At that time it was returned to the Army which redesignated it as the Army Air Forces Convalescent Hospital, Plattsburgh. On 25 January 1946, the installation was declared surplus by the War Department, and it was officially closed on

15 March 1946. On 22 September 1946, the Associated Colleges of Upper New York obtained the property and opened a center where college courses were offered to World War II veterans. This center became part of the State University system in 1950 and was known as Champlain College at Plattsburgh.

On 28 March 1952, the State of New York returned the property to the United States and on 29 January 1954, ground was broken for construction of Plattsburgh Air Force Base. The base included the old military installation ("Old Base") and 3,000 acres of newly-purchased land ("New Base"). The 380th Bombardment Wing and the 380th Air Base Group were activated at Plattsburgh on 11 July 1955. On 1 February 1956, the 820th Air Division was activated and the 380th Bombardment Wing was assigned to the division. Eventually, the organizational structure of the wing included three squadrons of B-47 Stratojets, a KC-135 Stratotanker squadron, the 380th Combat Support Group and the 820th Medical Group (Chamber of Commerce, 1984).

The B-47 Stratobombers, which inaugurated Plattsburgh Air Force Base (PAFB) as a medium range bomber base under the Strategic Air Command (SAC), were phased out completely by 14 December 1965. The first aircraft of the B-52 Stratofortress squadron arrived on 19 June 1966, beginning a new phase of local Air Force history. Following the selection of Plattsburgh AFB as a location for the FB-111 swing-wing bombers, the B-52s began their phase-out in October of 1970, with the last of the jet engine Stratofortresses departing 5 January 1971. FB-111s are currently assigned to the base. The Wing became fully operational 1 January 1972. In July of 1972, the wing was redesignated the 380th Bombardment Wing (Medium).

Sites for the Atlas "F" missile facilities supported by PAFB were selected during the period from 29 September 1959 to 15 March 1960. Geological investigations for these sites were conducted by the Corps of Engineers. Construction on the first site was begun on 1 July 1960. The site activation phase was initiated 30 November 1961 on a joint occupancy basis, and the last

site was accepted by the Air Force 9 December 1962. All sites were inactivated 15 April 1965, declared excess 30 June 1965, and placed on caretaker status. All sites have been disposed of with final disposition taking place 23 September 1970 (PAFB, 1977).

2. Mission

Plattsburgh AFB is the largest tactical wing in the Strategic Air Command, United States Air Force. Its mission is to develop and maintain operational capability to permit the conduct of strategic warfare according to the emergency war order.

The primary flying mission of the base is accomplished by the 380th Bombardment Wing which consists of a tactical force of two FB-111 squadrons and two KC-135 squadrons. The 380th is responsible for organizing and training a force capable of immediate and sustained long-range offensive bombardment and air-to-air refueling operations on a global scale, and for tasks assigned in support of current emergency plans and related operational orders. The 380th Combat Support Group is a major support unit assigned to the Wing. Its mission of supporting the tactical units is the primary nonflying mission of the base. This support includes supply and equipment management, security, transportation, housing, dining facilities, maintenance, all civil engineering work, all non-appropriated funds and services support, and contractual work with civilian companies for certain work on base (PAFB, 1977).

Maintenance support for the mission of the 380th Bombardment Wing is provided by several maintenance squadrons including avionics, field, munitions, and organizational maintenance squadrons. The duties of each squadron are discussed in Section IV.A of this report.

III. ENVIRONMENTAL SETTING

A. Meteorology

All of New York State has a humid continental climate, however considerable climatic variety may be found within the state. The greatest changes in climate occur in the mountainous area.

The upstate portion of New York near Plattsburgh includes three major microclimates. These climatic variations are due to variations in physiography, the most important and geographically largest of which is the Adirondack and Tug Hill Uplands known commonly as the Adirondack Mountains. This area has extremely cold and snowy winters with cool and wet summers due to its relatively high latitude and elevation.

The second microclimatic province is relatively small and encompasses a long, narrow area along the Hudson River Valley. Because of its north-south orientation, it exhibits a wide range of climatic conditions. Both temperature and precipitation increase as one moves southward.

The third microclimatic region includes the lowland areas which surround the Adirondack Upland; the Ontario Plain, the St. Lawrence Lowland and the Lake Champlain Lowland. The Lake Champlain Lowland is one of the driest areas in the state because it is geographically located in the rain-shadow of the Adirondacks. In addition, it is the coldest lowland in the state. Moisture-laden air which normally moves west to east across the state is continually being intercepted by the western flank of the Adirondacks, causing increased precipitation in the mountains and preventing heavy rainfalls from reaching the lowlands (PAFB, 1977; PAFB, 1984).

The average annual temperature at Plattsburgh AFB is 44°F, with recorded extreme temperatures of 99°F and -34°F. Yearly precipitation averages 29.4 inches and is fairly evenly distributed throughout the year.

The maximum 24-hour rainfall on record was 3.02 inches. The average relative humidity is 68 percent.

Heavy snowfalls are frequent during the winter, and snow remains on the ground for several months. The average annual snowfall is 68 inches. The maximum snowfall in any 24 hour period was 22.1 inches. Table III-1 is a summary of temperature, precipitation, snowfall, and relative humidity data collected over the last 24 years at Plattsburgh AFB.

Greater than 80 percent of all winds at Plattsburgh AFB are of speeds of 10 knots or less. Frequently, however, the topography of the region around the base channels the stronger winds from the west-northwest and south-southeast quadrants to such an extent that wind speeds of greater than ten knots are observed.

B. Geology and Soils

1. Geography and Topography

Plattsburgh AFB lies along the upper west side of Lake Champlain and has approximately two miles of shoreline on the western shore of the lake. Two rivers, the Saranac and the Salmon, flow along the base boundaries to the north and south, respectively (PAFB, 1984). The Adirondack Mountains lie 20 to 30 miles to the west and south of the installation, and the Green Mountains of Vermont are 25 to 40 miles to the east. The southern end of the relatively broad and flat St. Lawrence Valley lies about 30 miles to the north. The ground surface is gently rolling in the area of the base. The elevation of the base ranges from approximately 100 feet to 250 feet above sea level. The airfield elevation is 235 feet above mean sea level (PAFB, Tab C-6, 1979). Storm water drains north to the Saranac River, south to the Salmon River, and east to Lake Champlain (PAFB, 1977).

TABLE III-1. METEOROLOGICAL DATA

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Yrs Rec
Temperature °F														
Highest	58	53	73	89	95	97	99	95	90	86	71	61	99	24
Mean Daily Maximum	25	27	37	52	64	74	78	76	68	57	44	30	53	24
Mean Daily Minimum	7	9	21	33	44	54	59	57	49	39	30	15	35	24
Lowest	-34	-25	-12	10	24	33	41	36	28	16	1	-21	-34	24
Mean Number of Days														
Maximum Temperature $\geq$ 90°F	0	0	0	0	0.6	2.6	4.6	1.8	*	0	0	0	3	24
Minimum Temperature $\leq$ 32°F	30	27	27	15	3	0	0	0	1	9	19	28	158	24
Precipitation														
Mean Inches	1.64	1.67	1.96	2.19	2.53	3.10	3.03	3.7	2.59	2.52	2.36	2.28	29.412	24
Mean Number of Days > 0.5 Inches	0.5	0.6	1.0	1.1	1.1	1.6	1.3	1.7	1.1	1.3	1.3	1.1	13.5	24
Snowfall														
Mean Inches	15.1	13.9	11.9	4.0	0.2	0	0	0	†	0.2	4.9	17.8	68	24
Mean Number of Days > 6 inches	*	*	*	*	0	0	0	0	0	0	*	1	2.5	24
Relative Humidity (%)														
Mean	67	64	64	59	70	68	68	72	73	70	71	71	68	24

Maximum 24 hour precipitation 3.02 inches in 24 years of record
Maximum 24 hour snowfall 22.1 inches in 24 years of record.

Flying weather annual percentages for various categories:

A	Ceiling < 200 feet and visibility < 1/2 mile	<0.5%
B	Ceiling < 1,000 feet but $\geq$ 200 feet and visibility < 2 miles but $\geq$ 1/2 mile	4.5%
C	Ceiling < 3,000 feet but $\geq$ 1,000 feet and visibility < 3 miles but $\geq$ 2 miles	8.5%
D	Ceiling $\geq$ 3,000 feet and visibility $\geq$ 3 miles	86.5%

Source: USAF, SAC Comprehensive Plan Meteorological Data, PAFB, TAB No. D-1, 1983.

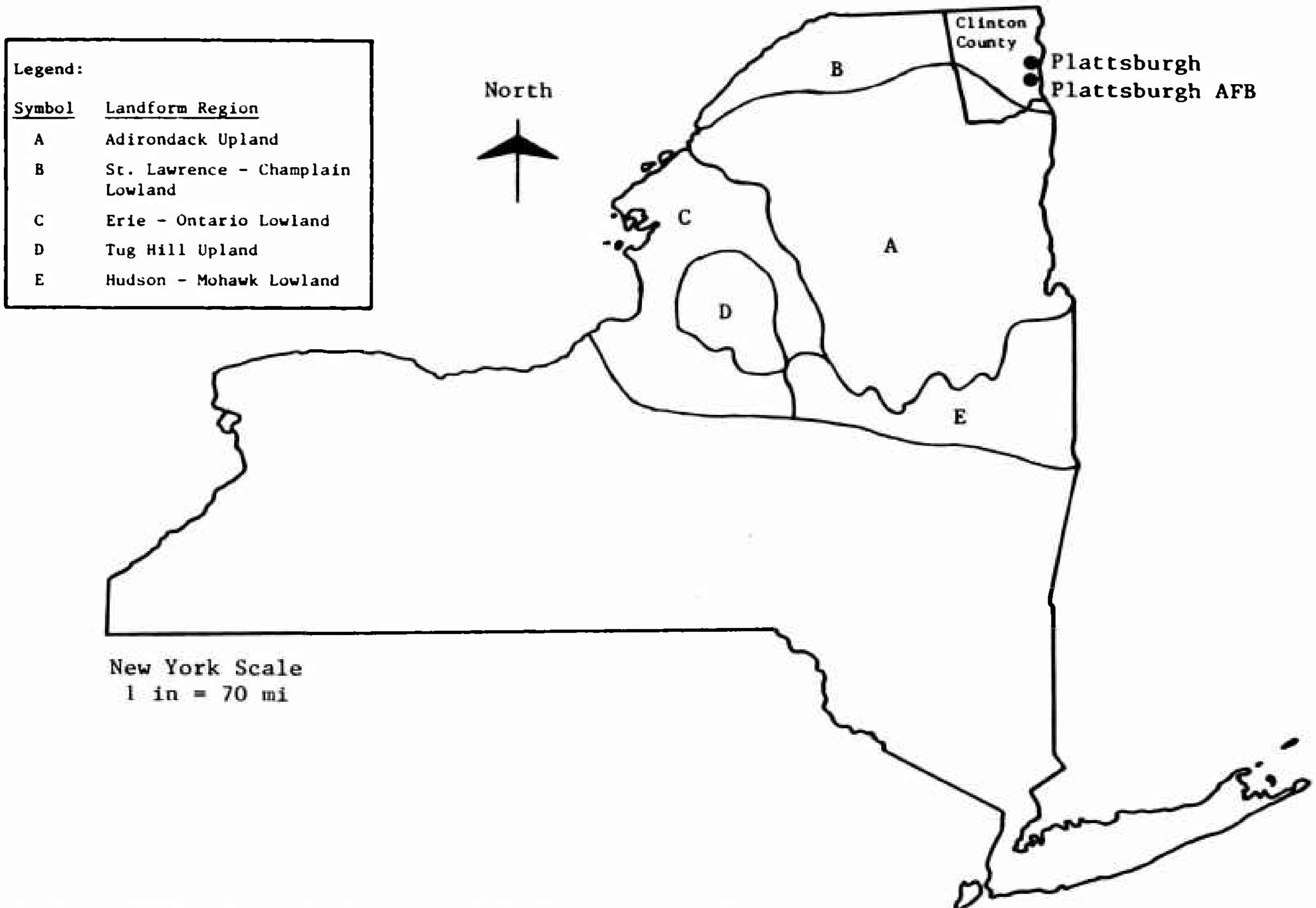
* - Denotes less than 0.5 days
† - Denotes less than 0.05 inches

The northern New York-Lake Champlain region may be divided into five major landform areas as shown in Figure III-1. Although each is unique in topographic characteristics, all have been glaciated. Glaciation has both modified the preglacial topography and created unique landforms. Of primary interest are the two areas which include Plattsburgh AFB and its region of influence in Clinton, Essex, and Franklin Counties.

The Adirondack Upland, largest of the landform regions, is a dome of Precambrian rock roughly circular in outline and approximately 125 miles in diameter. It is one of two extensions of Canadian Shield geology into the United States, with the other being the Superior Upland of Minnesota and Wisconsin. This area is often referred to as the "Adirondack Mountains". The northwestern part of the Adirondacks is a rolling upland of gentle relief with a mean elevation of about 1,000 feet above sea level, whereas the southeastern part is a rugged mountain mass. The general level of the terrain rises gently from the west to the higher eastern parts where 16 peaks exceed 4,000 feet in elevation. Mount Marcy, the highest peak, has an elevation of 5,344 feet. The western section is an area of relatively low relief, with surface elevations of only a few hundred feet and many glacially rounded rock knobs.

Four major watershed areas drain the Adirondack Upland. The northwestern part drains to the St. Lawrence River, the northeastern part to Lake Champlain, the southeastern part to the Hudson River, and the southwestern part to Lake Oneida and eventually to Lake Ontario.

The St. Lawrence-Champlain Lowland is the second landform region to be considered. Underlain primarily by sedimentary rock, the area exhibits low elevation and low relief. Relief gradually increases inland from the water bodies. During recent glacial history, both marine and lake sediments were deposited on top of the predominantly limestone and sandstone bedrock. Lake Champlain itself is a product of glaciation.



Source: PAFB, Tab A-1, Environmental Narrative, 1977.

Figure III-1. Landform Regions in Upstate New York

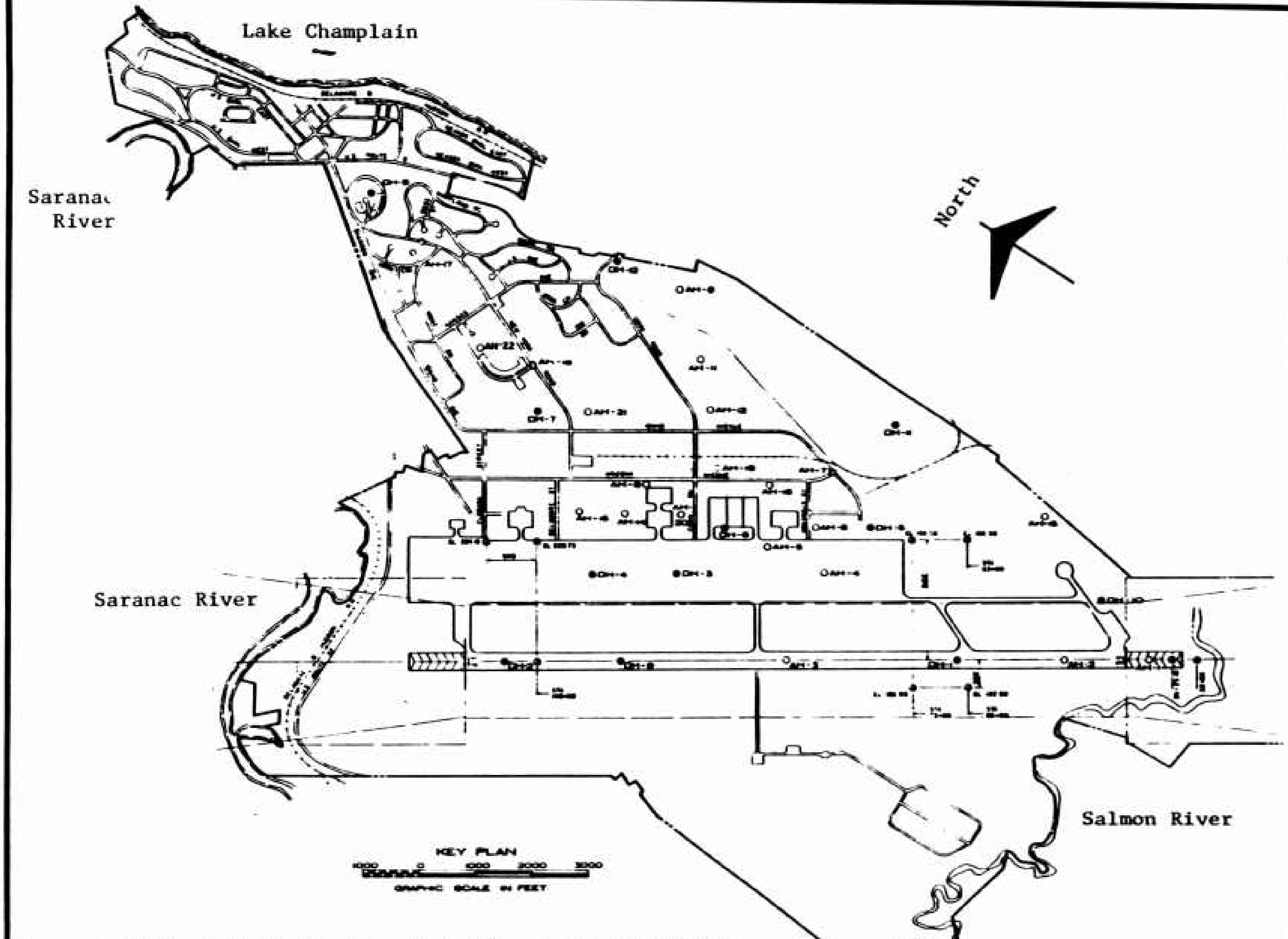
2. Soils

Recent glacial history and the varied topography, climate, and vegetation of northern New York all combine to produce considerable variation in the soils of the region. Because of glaciation, the soils are relatively young, yet a large variety of soils, from poorly drained bogs to very sandy soils on hillslopes, is present.

In the Adirondack Upland, shallow acid soils overlie glacial till. Surrounding this dome area, the soils are irregularly distributed. Soils range from limey clays of the Lake Champlain Lowland to coarse textured soils developed on sands and gravels (PAFB, 1977). Plattsburgh AFB is underlain by sandstone and granitic gneiss which has resulted in the formation of sandy, acidic and low fertility soils throughout the base. Soil borings and exploratory pits on the base indicate poorly graded sand as the dominant material. This material extends from the ground surface to depths of 10 or more feet (see Figure III-2a and III-2b).

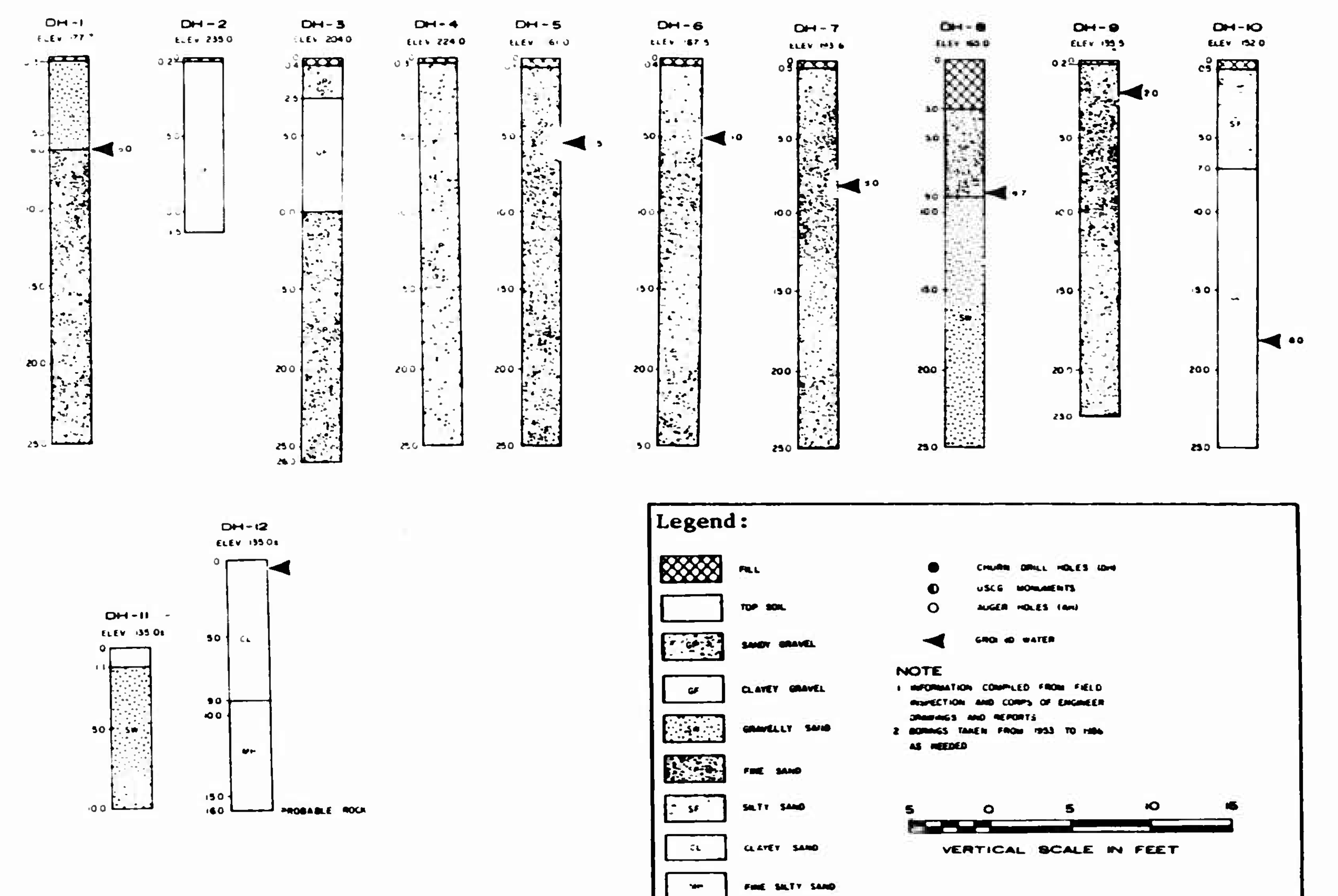
A number of soils and soil associations are found in Plattsburgh. Generally, the area of Cumberland Head is mostly Massena and Panton-Covington; the central area of Plattsburgh is Amenia-Massena, Coveytown-Walpole, and Massena; and the western portion of Plattsburgh is almost entirely Colton-Worth. Figure III-3 is a map of the soil associations found in Plattsburgh. Descriptions of the soil associations are listed in Table III-2.

The Clinton County office of the U.S. Soil Conservation Service surveyed all of the county soils and prepared maps and a report on the findings in 1973. None of the soils on Plattsburgh AFB were mapped in this study, however the following inferences were made in the Base Comprehensive Plan Tab A-1 about the soils on base from examination of the soil associations that occur along the base boundaries. Two major soil associations probably encompass the grounds of Plattsburgh AFB: the Adams and the Junius Associations. The Adams Association encompasses approximately two-thirds of the base extending from



Source: PAFB, Soil Boring Map, Tab C-6, revised 09/30/83.

Figure III-2a. Map of Plattsburgh AFB Showing Borehole Locations



Source: PAFB, Soil Boring Map, Tab C-6, revised 09/30/83.

Figure III-2b. Soil Borings Taken on Plattsburgh AFB

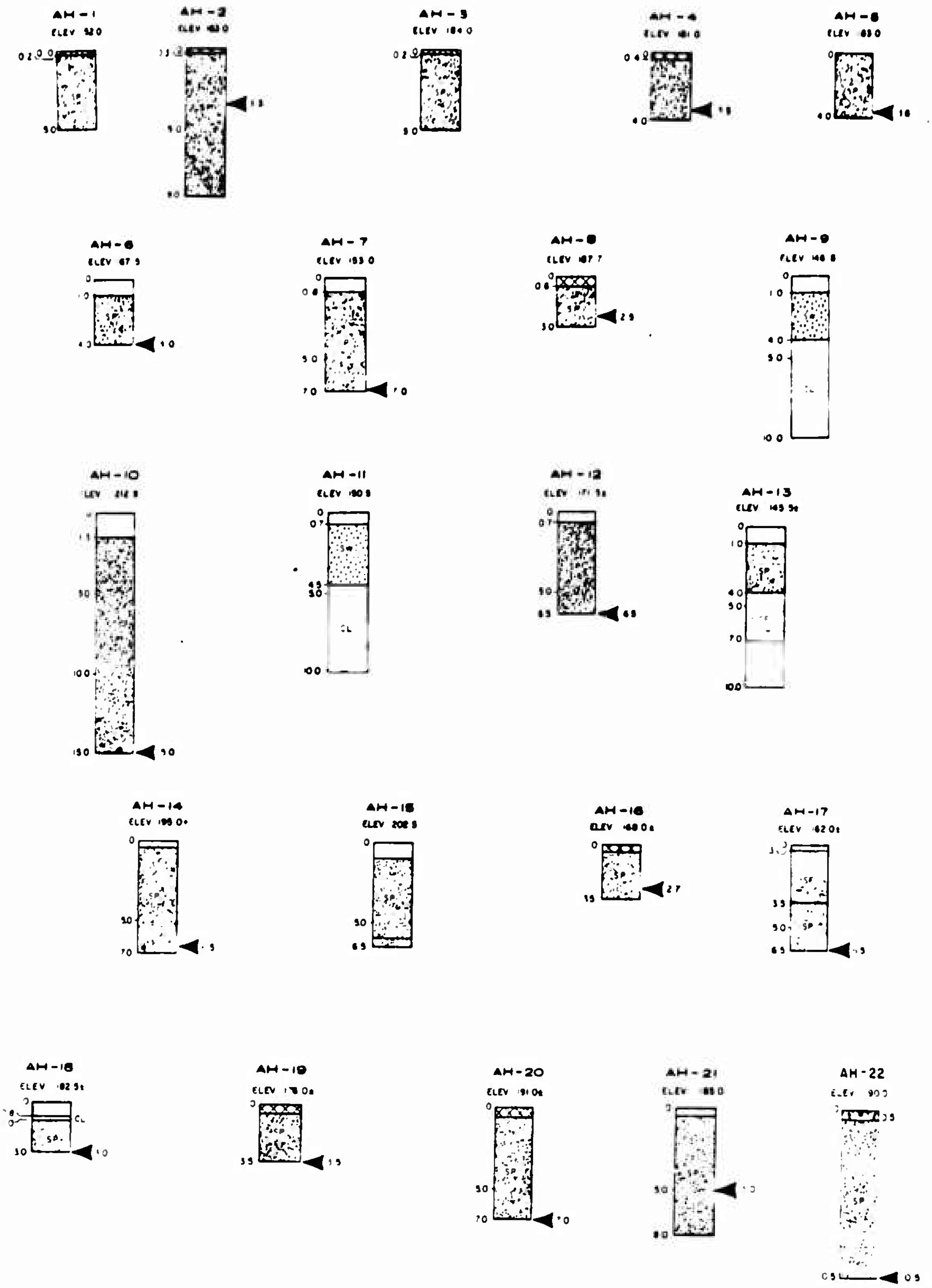
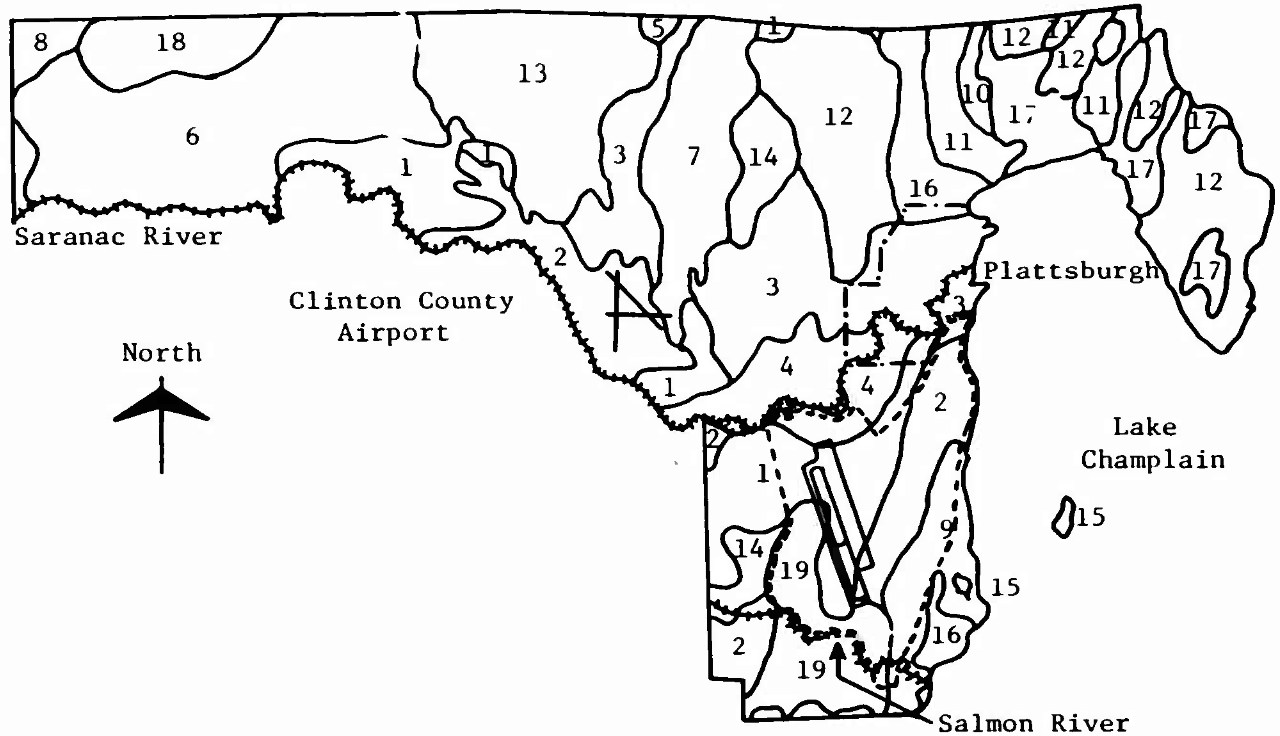


Figure III-2b (Continued). Soil Borings Taken on Plattsburgh AFB



Source: PAFB, TAB A-1, Environmental Narrative, 1977.

Legend:

Rivers
- - - - Plattsburgh AFB Boundary
— · — · Plattsburgh Boundary

For explanation of soil symbols see Table III-2.

Scale: 1 in = 7 mi

Figure III-3. Soil Map for Plattsburgh, Clinton County, New York

TABLE III-2. SOIL IDENTIFICATION LEGEND

Symbol	Soil Association	Description of Soil
1	Adams	Large level flats of extremely acid, loamy fine sands.
2	Adams-AuGres and Groghan	Sandy soils with shallow ground-water tables. Loamy sands developed on deltas built into glacial lakes.
3	Amenia-Massena	High lime content, excellent structure of the plowed layer, and a high proportion of soil having good moisture relations. Parent material is glacial till.
4	Colton	The dominant soil type is strongly acid and droughty. Found in deposits of well-stratified gravel on large flats along the Saranac River.
5	Coveytown-Amenia	Characterized by distinctive topography: well-defined but low ridges alternate with broad level flats. Forty percent too stony for cultivation.
6	Colton-Worth	Large flats of sandy soils with poor to somewhat poor drainage and low fertility. Twenty percent too stony for cultivation.
7	Coveytown-Walpole	Large flats of sandy soils with poor to somewhat poor drainage and low fertility.
8	Empeyville-Westbury	Large areas of very stony soils, low fertility, fairly good drainage.
9	Junius and Kibbe	Junius is dominated by somewhat poorly drained sandy loams and Kibbe by very fine sandy loams. Both are found mainly on flats or very gently sloping areas. The soils are free of stones, have very good physical properties, and are underlain by heavy clays at a depth of 2-3 feet in about 80 percent of the area.

TABLE III-2. SOIL IDENTIFICATION LEGEND (Continued)

Symbol	Soil Association	Description of Soil
10	Livingston-Covington	Typically found in depressions within Panton-Convington areas. Poorly drained.
11	Fresh-water Marsh	Areas along Lake Champlain with a ground-water level at or above the surface for part of the year.
12	"Massena Association"	A thin layer (2-3 feet) of glacial till overlies f. .t limestone rock. Somewhat poorly to poorly drained.
13	Moira-Coveytown	Characterized by low beach ridges that rest on glacial till and intervening flats where wave action of ancient lakes removed the silt and clay, leaving sandy wet deposits.
14	Massena	Loam and loam with a clay loam horizon at 12-15 inches below ground. Level to undulating topography, somewhat poor to poor drainage.
15	Nellis-Amenia-Massena	Shallow stony soil in areas of rough topography, common bedrock (limestone) outcrop, and large "flat rock" areas.
16	Panton-Covington	Poorly to somewhat poorly drained soils on nearly level areas of marine clays.
17	Panton-Covington (Till Phases)	Soils of silt loam and silty clay loams. Undulating topography. Parent material consists of marine sediments that were overridden and mixed with coarse material by glaciers.
18	Stony Land	Stony areas with small areas of non-stony soils. Land mainly abandoned or in forests.
19	Walpole	Wet, nearly level sandy soils.

the western boundary to near the embankment portion of the old base. The Junius Association extends from the shoreline up over the embankment to intermingle with the Adams Association (PAFB, 1984).

Adams soils are deep, well to excessively well-drained, coarse textured sandy soils derived from granitic gneiss and Potsdam sandstone. These soils have 18 to 30 inches of loose or very friable, rapidly permeable sand or loamy sand over loose, rapidly permeable coarse or medium sand. Adams soils occupy broad, nearly level to gently sloping sand plains and deltas.

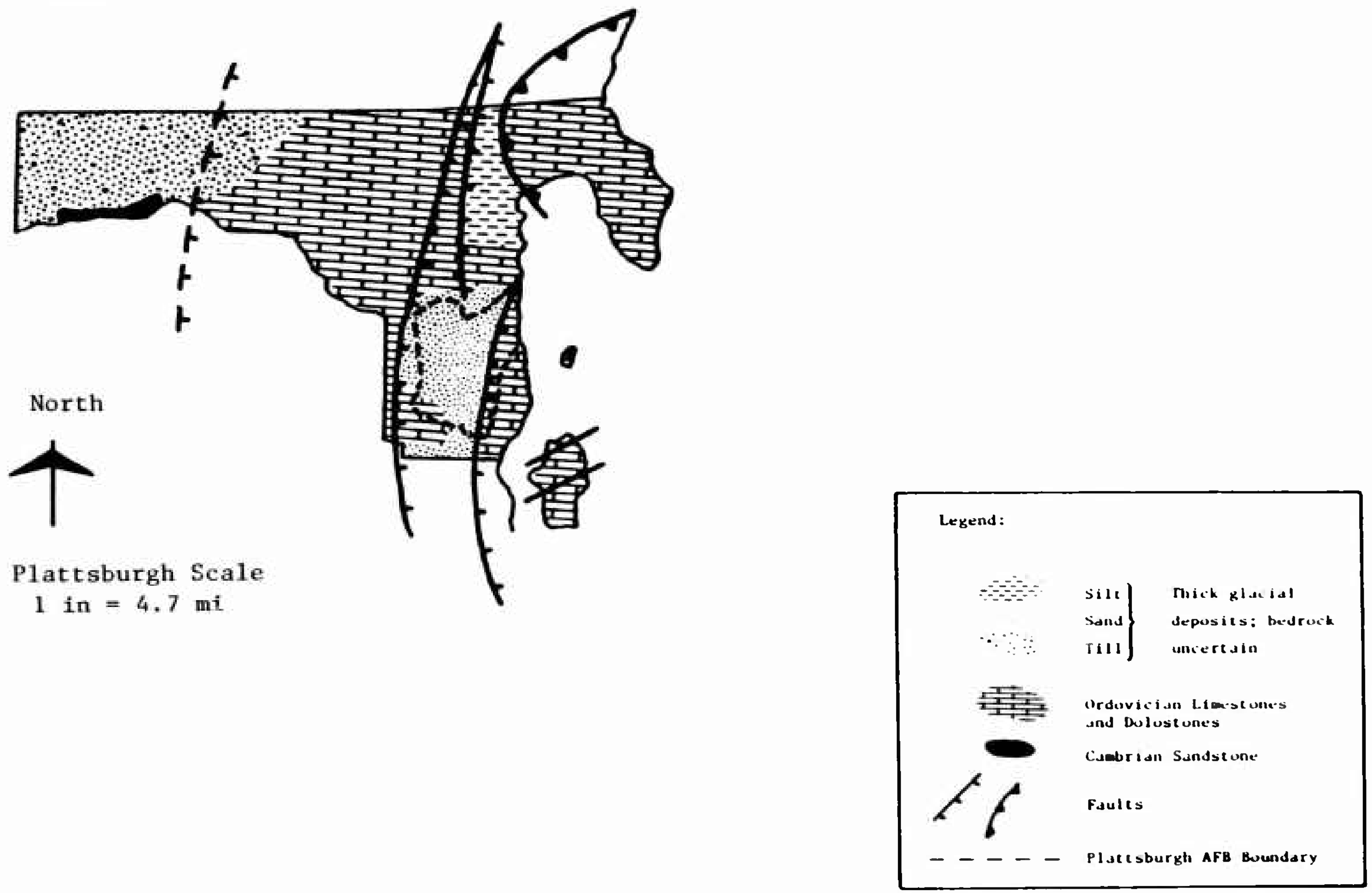
Minor inclusions of Colton and AuGres Soils make up part of the Adams Association. Colton soils occur on similar land forms but have a higher content of gravel. AuGres soils occupy wetter, lower lying level areas. These soils are fair agricultural soils.

Junius soils are deep, somewhat poorly drained, lacustrine, sandy deposits of glacial lakes and pond bottoms. The areas are nearly flat or slightly depressional. These soils have 18 to 36 inches of rapidly permeable loamy sand over stratified fine sand and sand.

Minor inclusions of the Livingston-Covington soils make up part of the Junius Association. These soils occupy flat or slightly depressional areas. Covington and Livingston soils have a clayey profile; thus, they tend to be very poorly drained soils (PAFB, 1984).

3. Geology

A map of the bedrock geology in the town of Plattsburgh is presented in Figure III-4. The oldest sedimentary rocks are exposed along the Saranac River near Cadyville, west of Plattsburgh AFB. This formation, the Potsdam Sandstone of Cambrian age, is probably 530 million years old. The Potsdam Sandstone is used as building stone throughout the North Country section of upstate New York.



Source: New York State Geological Survey, Geologic Map of New York, 1970.

Figure III-4. Bedrock Geology in Plattsburgh

During the Ordovician Period (500 million to 425 million years ago) the encroachment of the sea on the land changed the sea floor environment from sandy near-shore characteristics to clearer water, hospitable to many life forms. Deposits of lime shells of these life forms and the sea water led to the limestone layers found throughout central and eastern sections of the town of Plattsburgh.

The site of the town was probably above sea level for most of the rest of geologic history. Remnants of the last ice age (Wisconsin glacier) and the lake and inland sea that followed are evident in the area. The ice mass flowed south-southwest over the town site, eroding and smoothing the bedrock, as well as depositing glacial sediments (till). The glacial till found in the northern and western parts of the town is the unsorted debris--from clay to sand to boulders--deposited from the ice sheet (Town of Plattsburgh Master Plan).

Most of the extensive delta deposits of sand along the Salmon and Saranac Rivers in South Plattsburgh and West Plattsburgh (near Cadyville) are a result of the fluctuating water levels of glacial Lake Vermont, associated with the meltwater generated by the receding glacier. The extent of these deposits from the Lake Vermont stage was enlarged by an inland sea known as the Hochelaga or Champlain Sea which succeeded Lake Vermont.

Once the glacier retreated, surface rebound resulted in faulting and general uplifting of the land. This produced many of the familiar post-glacial features present today, including Lake Champlain, Valcour Island, Crab Island, and Garden and Schuyler Islands.

4. Drainage

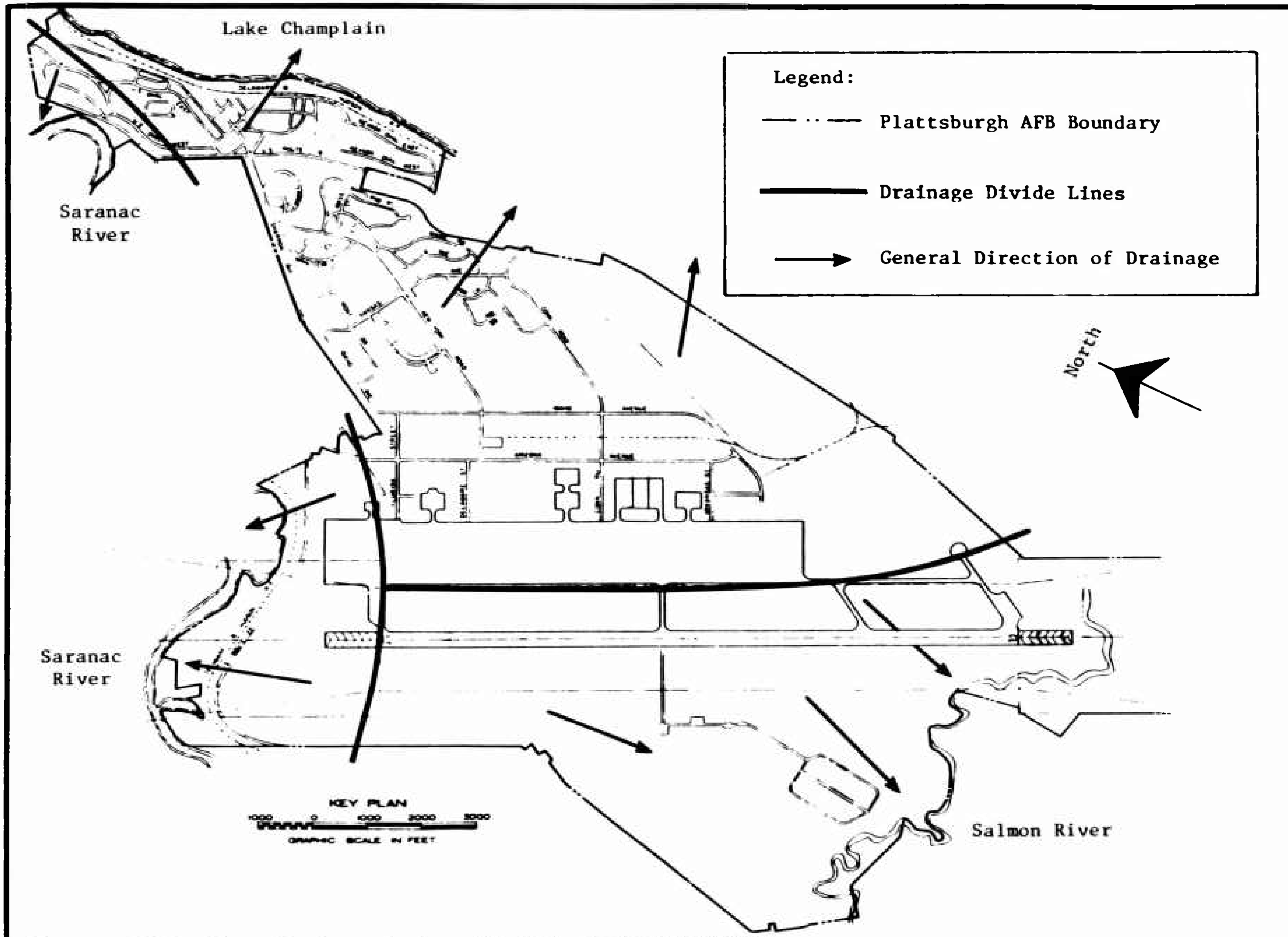
Plattsburgh AFB is located in the Lake Champlain drainage basin. Lake Champlain is the dominant physical feature of this 8,234 square mile drainage basin located between the Adirondack Mountains to the west and the Green Mountains to the east. Tributaries which drain the basin account for 90

percent of the water entering Lake Champlain. Surface waters of the lake, one of the largest freshwater lakes in the United States, flow northward discharging into the Richelieu River in Quebec.

Surface water is removed from Plattsburgh AFB through a storm drainage system of surface ditches and underground lines. The Saranac River, Lake Champlain, and Salmon River on the north, east, and south, respectively, define the geographic boundaries of the base and provide natural drainage for the surface ditches and underground lines. The runway and weapons storage areas drain southward to the Salmon River except for approximately 1,500 feet along the north end of the runway (overflight area) which drains northward into the Saranac River. All remaining portions of both the new and the old base generally drain eastward toward Lake Champlain (PAFB, 1984). The general directions of drainage on the base are shown schematically in Figure III-5.

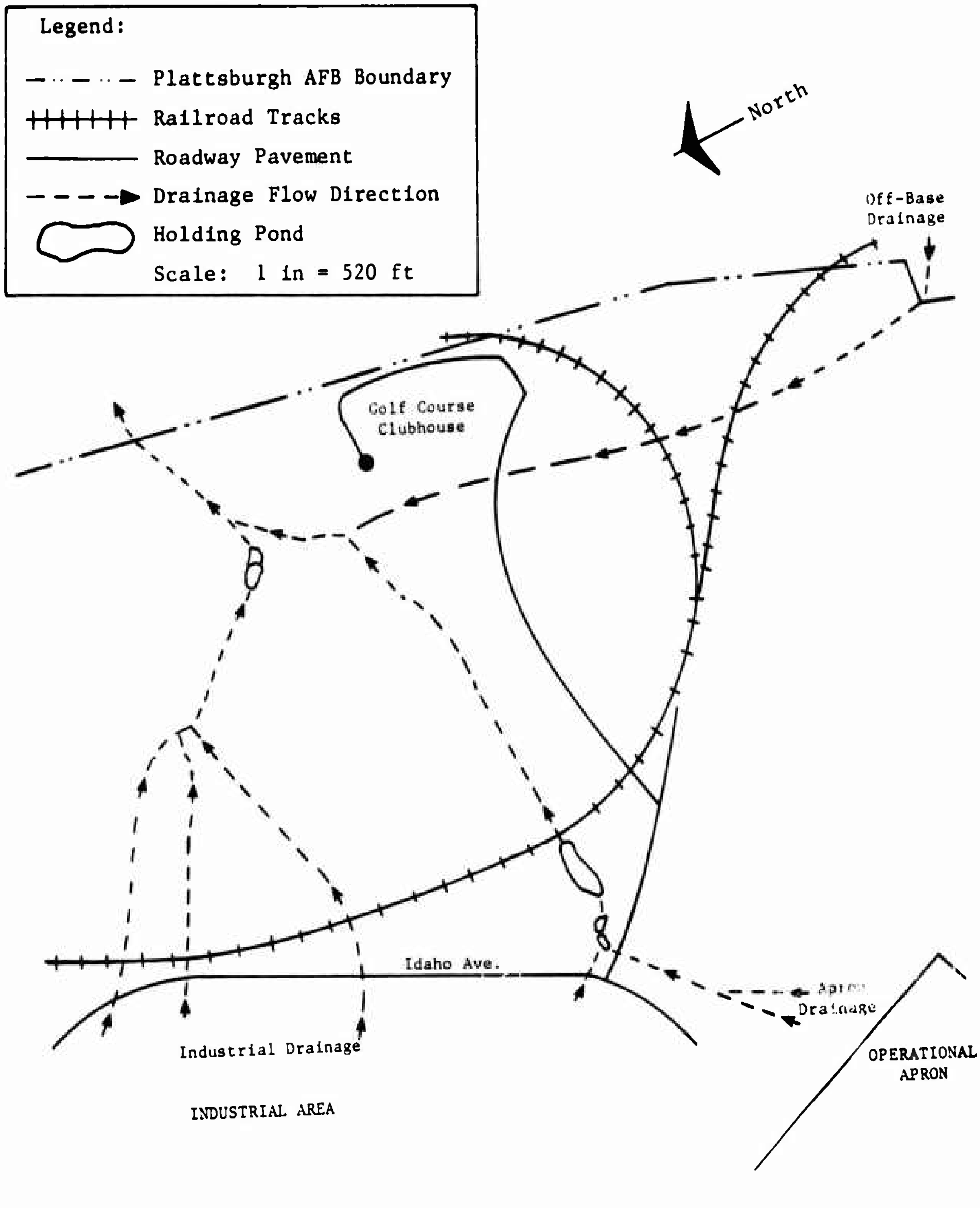
The south end of the ramp and most industrial areas east of the ramp drain into a series of holding ponds on the golf course. The industrial area runoff flows through two ponds, and the ramp runoff flows through a separate series of three ponds. A diagram of the pond systems is presented in Figure III-6. These ponds are equipped with oil absorbent booms. Two of the ponds have outlet weirs designed to skim off oil and grease, while allowing the water and water soluble constituents to flow on to the next pond in the series. The two pond system effluents converge and drain into Lake Champlain east of the base. Base personnel have reported the presence of dry weather flow in these streams, suggesting that in addition to storm water drainage, these streams serve as a discharge point for ground water in the area.

The north end of the flightline, including the SAC Alert Area, drains northward into the Saranac River through storm drains. This drainage route is equipped with a gate valve located along Perimeter Road north of the Alert Area. In the event of a major spill on the flightline this valve is closed manually to prevent contaminants from reaching the Saranac River.



Source: PAFB, Storm Drainage System, Tab G-3, Revised 09/30/83.

Figure III-5. Drainage Pathways on Plattsburgh AFB



Source: PAFB, Storm Drainage System, Tab G-3, Revised 09/30/83.

Figure III-6. Flightline and Industrial Area Drainage System

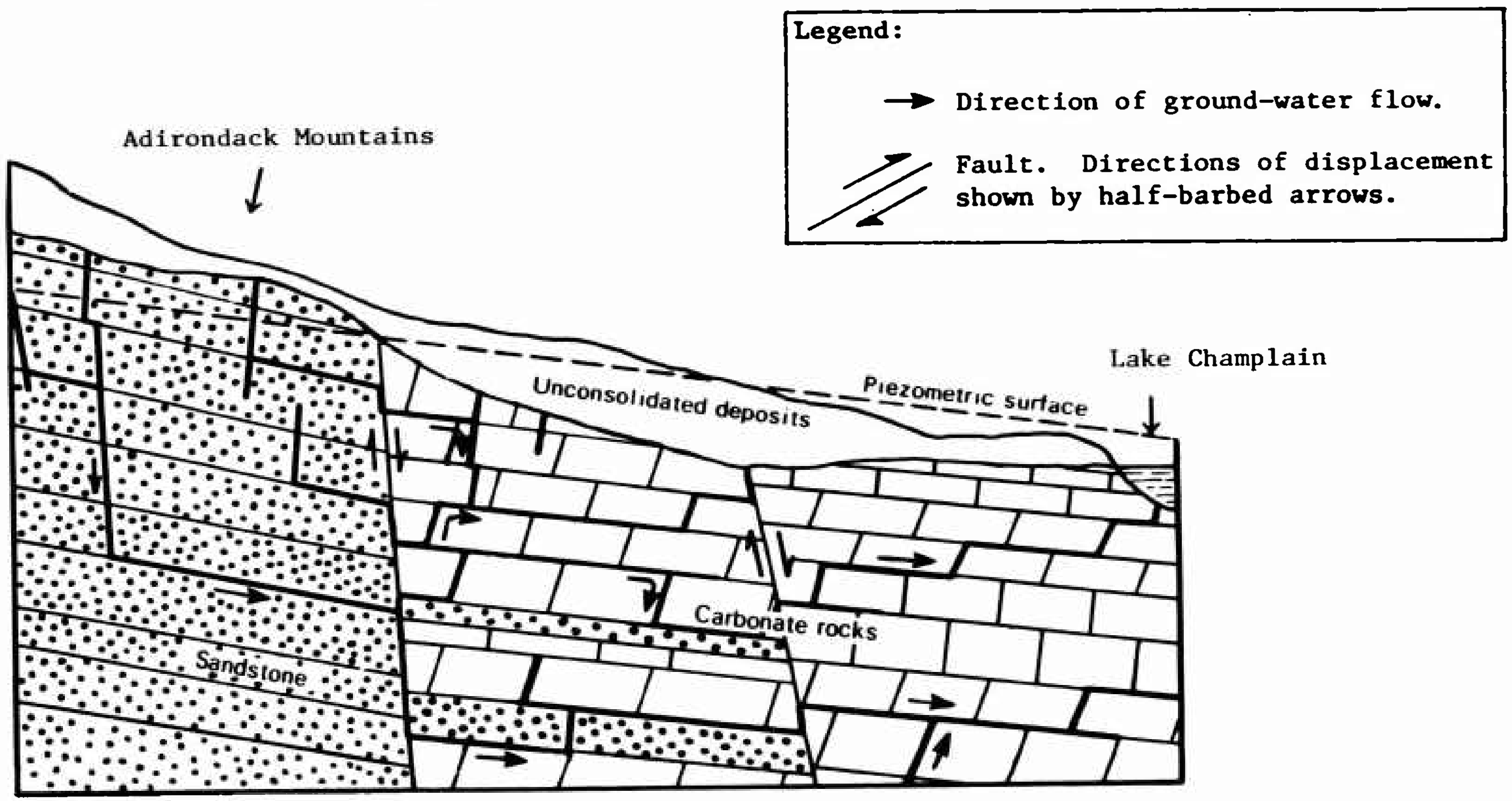
The Plattsburgh area receives approximately 30 inches of precipitation annually. It is estimated that 20 inches of this precipitation is lost to evaporation and transpiration. Of the remaining ten inches, seven inches drain to surface water as runoff. The sandy soils in the area allow infiltration of up to three inches of the annual precipitation (Clinton County Planning Office, 1978).

C. Ground-water Hydrology

1. Ground-water Resources

An artesian aquifer consisting of sandstones and carbonates extends from Keeseville to the Canadian border and from the Adirondacks to Lake Champlain in the Champlain Valley. The depth to the aquifer varies throughout its extent but is generally greater than 100 feet for both types of rock. The carbonate bedrock may lie over 300 feet below the ground surface and tends to be deeper than the sandstone portion of the aquifer. The aquifer dips gently to the east, with water movement being west to east. Recharging of the aquifer takes place from precipitation on the eastern slopes of the mountains, from leakage through overlying unconsolidated deposits, and from small surface streams (PAFB, 1977). A schematic diagram showing a general west-east vertical section of the aquifer is presented in Figure III-7. The ground water discharges into the larger surface streams, possibly including the Saranac and Salmon Rivers, and to Lake Champlain.

Water from this aquifer is used in several areas for community water supplies. In particular, residents of the City of Plattsburgh who are not serviced by the municipal water system draw water from this aquifer. Municipal water is obtained from reservoirs created by damming the Saranac River approximately ten miles upstream of the City of Plattsburgh. Plattsburgh AFB does not tap ground-water resources on the base. Each of the two remote



Source: Giese, G.L., and W.A. Hobba, Jr., 1970.

Figure III-7. Schematic West-East Vertical Section Showing the Movement of Ground Water Through the Bedrock Artesian Aquifer of the Northern Lake Champlain Basin

communications sites has an on-site well for non-potable water. The base purchases treated water from the City of Plattsburgh and stores it on base in an elevated 750,000 gallon steel tank.

Yields of wells finished in the sandstone part of the aquifer range from two to 30 gallons per minute (gpm) and average 15 gpm. Yields of wells finished in the carbonate part range from two to 200 gpm and average 35 gpm. The wells finished in the carbonates are deeper than the wells completed in sandstone. Fifty percent of the wells completed in sandstone are less than 100 feet deep, whereas only 37 percent of the wells completed in carbonate rocks are less than 100 feet deep. Ground-water discharge from the aquifer is estimated as 11 million gallons per day (Giese and Hobba, 1970).

The existence of a shallow aquifer in the vicinity of Plattsburgh AFB is not substantiated. It is known that a consolidated carbonate and limestone aquifer in the region slopes gently upward toward the east and is exposed at the shore of Lake Champlain. Thus, the overlying glacial material and weathered sands that constitute the unconsolidated layer cannot be very deep in the vicinity of the base. Because this region has been glaciated, unconsolidated formations tend to be irregular. This suggests that the existence of a single contiguous aquifer in the unconsolidated layer is unlikely. Subsurface water may be present in these unconsolidated deposits, however, and its presence may be attributed to two factors. First, recharge from precipitation may create pockets of subsurface water that are prevented from vertical seepage by the consolidated aquifer. Second, the carbonate-sandstone aquifer is known to be artesian. Upward leakage from the artesian aquifer may recharge overlying unconsolidated deposits and create subsurface water pockets in random areas around Plattsburgh. Because the topography of the region drains toward the east, any subsurface water in the unconsolidated deposits would eventually make its way to Lake Champlain.

The Saranac and Salmon rivers may also be key discharge outlets for drainage of subsurface water pockets. The irregularity of unconsolidated deposits that may contain subsurface water of this nature preclude its use as a resource in the Plattsburgh area.

In addition to the artesian aquifer, another important ground-water area in the Lake Champlain-Upper Hudson region is the Plattsburgh sand--the sand and minor sand and gravel deposits located immediately south of the City of Plattsburgh. This area is tapped by only a few wells and little is known about the water-bearing characteristics of the deposits. However, existing well and geologic data suggest that this is among the more significant ground-water areas of the Lake Champlain Basin.

The Plattsburgh sands extend about as far south as Ausable Chasm and approximately eight miles inland from Lake Champlain. Large outcrops of till and bedrock protrude through the sand in several places. The deposit is predominantely sand with a few small areas of sand and gravel near the Saranac River. The sand part is generally composed of very fine- to coarse-grained sand which is better sorted in some parts of the deposit than in others. Better sorted sands are located at the higher elevations. The small sand and gravel deposits near the river usually consist of a mixture of medium-grained sand to coarse-grained gravel.

The thickness of the Plattsburgh sand ranges from over 100 feet in the valley bottoms near Morrisonville and Harkness to a fraction of an inch near its outer limits. At a well located near South Plattsburgh the sand is reported to be only six feet thick and underlain by clay. Near the mouths of the Au Sable and Little Au Sable Rivers the sand is about 100 feet thick (Giese and Hobba, 1970).

2. Ground-water Quality

Generally, the chemical quality of the ground water in the Lake Champlain-Upper Hudson region is good to excellent. The waters in most areas are suitable for most purposes and require little or no treatment other than chlorination to combat the danger of bacterial pollution. Ground water in the Plattsburgh area does contain high concentrations of alkalinity (HCO_3^-), sulfate, magnesium, total dissolved solids, and calcium. Total hardness ranges in concentration from 121 to over 180 parts per million (Giese and Hobba, 1970). Ground-water quality on the base itself is unknown since the resource is not used by Plattsburgh AFB nor by residential areas east of the base.

D. Surface Water Hydrology

1. Surface Water Resources

Plattsburgh AFB borders two rivers; the Saranac and the Salmon. Both rivers drain into Lake Champlain. The Saranac River, designated as one of the major rivers in the Lake Champlain basin, drains 608 square miles, 195 squares miles of which are in Clinton County.

Rivers and streams in Clinton County originally followed northeast-southwest trending faults, but this normal pattern was upset when the river channels were blocked by glacial ice. The new channels cut across the fault lines resulting in their present west to east orientation. The Saranac River is an example of this phenomonen.

2. Surface Water Quality

New York water quality management is accomplished through a state-wide monitoring system. The monitoring system measures the biological, bacteriological, physical, radiological, and chemical characteristics of state

waters. The information gathered determines whether the quality of the water is improving, degrading, or remaining stable. Lake Champlain is Class B water, or suitable for bathing. The Salmon and Saranac Rivers are Class C_t and Class C, respectively. Class C waters are suitable for fishing and other noncontact recreation, with the "t" designating trout waters (PAFB, 1977).

Surface drainage streams and ponds on Plattsburgh AFB have been sampled and analyzed periodically since July of 1979. Sample points are described and analytical results are presented in Table IV-6. Concentrations of volatile organic compounds and oil and grease have been occasionally detected at seven sampling points. Methylene chloride, tetrachloroethylene, methyl ethyl ketone (MEK), benzene, and toluene are among the constituents detected in these samples in concentrations of micrograms per liter.

E. Environmentally Sensitive Conditions

The base has a generally healthy, naturally landscaped environment. In addition to several weedy growth species, including dandelion, ragweed, and milkweed, several species of woody plants, shrubs, grasses, and trees are commonly found on the base. Grasslands cover 1,961 acres and include such species as Smooth Brome, Orchard Grass, and Kentucky Blue. Forests cover 850 acres on the base, and include softwoods such as balsam fir, white spruce, and red and white pines, as well as the hardwood oaks, basswood, and varieties of crabapple. No threatened or endangered plant species have been identified on the base.

There are no large wild or domestic animals on Plattsburgh AFB other than family pets and Security Police Patrol dogs. Although a number of common small animal species do habitate the base, no threatened or endangered species have been identified.

F. Summary

Plattsburgh AFB is situated along the upper west side of Lake Champlain in northeast New York State. Located between the Adirondack Mountains of New York and the Green Mountains of Vermont, the base experiences heavy snowfall during the winter months and moderate rainfall distributed throughout the year.

The area around Plattsburgh AFB is underlain by sandstone and gneiss bedrock which has resulted in formation of sandy, acidic, and low fertility soils throughout the base. Drainage through these soils is good.

Ground-water resources in the area are not extensive. Yields of wells vary with depth and site location. Use of wells predominates among those not serviced by the municipal water system. Municipal water is supplied to the base and the City of Plattsburgh from an upstream reservoir on the Saranac River. The Saranac and Salmon Rivers border the base and empty into Lake Champlain. Smaller wet- and dry-weather streams are present on the base and drain to one of the rivers or Lake Champlain.

The base has a healthy natural environment including woodlands, grasslands, and landscaped areas. No threatened or endangered animal or plant species exist on the base.

IV. FINDINGS

Past hazardous waste management practices at Plattsburgh AFB were identified and evaluated for their potential to cause environmental contamination and/or to pose a threat to human health. This section provides a summary of typical wastes and estimated quantities generated by activity (IVA.1), a description of past and current disposal practices used at Plattsburgh AFB (IVA.2), and a site-specific evaluation of all disposal sites identified (IV.B). This section also covers activities and disposal practices at five adjacent sites belonging to Plattsburgh AFB. Information is only available from 1955 to the present.

A. Plattsburgh AFB Activity Review

To identify past activities on the base that generated hazardous wastes, a review of current and past waste generation and disposal methods was conducted. This review included interviews with current and former (both civilian and military) base employees, a search of files and records (maintained by Plattsburgh AFB and outside agencies), and site inspections.

1. Wastes Generated by Activity

Potentially hazardous wastes generated by Plattsburgh AFB can be associated with one of four groups of activities conducted on base:

- Industrial Operations (Shops);
- Fuels Management (POL);
- Pesticide Utilization; and
- Base Hospital and Laboratory Operations.

The following discussion addresses only those wastes generated on base which are either hazardous or potentially hazardous wastes. A hazardous waste is defined as hazardous by the regulations implementing either the Resource Conservation and Recovery Act (RCRA) or the Comprehensive

Environmental Response Compensation and Liability Act (CERCLA). Compounds such as polychlorinated biphenols (PCBs) which are listed in the Toxic Substances Control Act (TSCA) are also considered hazardous. Other substances such as oil spills, munitions and radioactive wastes which affect the quality of the environment are also considered hazardous wastes or potentially hazardous wastes. A potentially hazardous waste is one which is suspected of being hazardous, even in cases where insufficient data are available to fully characterize the waste.

a. Industrial Operations (Shops)

Several industrial shops and operations at Plattsburgh AFB generate hazardous and potentially hazardous wastes as a result of mission support activities. The Civil Engineering Squadron provided information which was used as a basis for evaluating waste generation and location of hazardous material usage. The files were examined for information on chemical usage, hazardous waste generation, and disposal practices.

Key personnel within the Plattsburgh AFB maintenance support functions were interviewed to provide additional information on which shops handle hazardous materials or generate hazardous waste. During the interviews, information was gathered concerning hazardous materials utilized, waste quantities generated and disposal practices for each shop. Where possible, past disposal methods were determined for the major wastes generated. Confirmation of some of the past disposal methods within the shops was difficult because written information was essentially nonexistent and remembered incidents were often not confirmed due to the elapsed time since occurrence. The information on waste quantities presented in the following section is based on information derived through record searches of the files as well as verbal estimates given by shop personnel at the time of the interviews. Areas of Plattsburgh AFB which do not generate hazardous waste are not included.

In general, shop wastes have been drummed or stored in tanks or bowsers prior to contract disposal off-site. The drums are generally stored at the buildings in which the wastes are generated until drum pick-up. Much of the material, especially waste oils, hydraulic fluid, and solvent, are contracted out for recycling.

Other identified methods of waste disposal are through the Defense Property Disposal Office (DPDO), and the sanitary sewer. Waste discharged to the sanitary sewers from major industrial shops is usually first treated by an oil/water separator. Facilities that have oil/water separators are listed in Appendix F. Sanitary sewage is pumped to the town of Plattsburgh and treated at the local public water pollution control facility.

Brief descriptions of the industrial shops which generate hazardous wastes are provided in the following paragraphs. The location and amount of each waste are provided.

1) Avionics Maintenance Squadron

The 380th Avionics Maintenance Squadron (AMS) performs organization and intermediate-level maintenance on avionics systems installed in the FB-111 and KC-135A aircraft. AMS is also responsible for maintenance, calibration, and certification of test equipment, and operates aircraft flight simulators for pilot training.

Precision Measurement Equipment Laboratory (PMEL). The PMEL calibrates and certifies electronic test equipment for all shops on the base. It is located in Building 2801. The PMEL generates 5 lbs/yr of waste mercury and turns it in to DPDO for recycling.

Aircrew Training Devices Branch (ATD). The Aircrew Training Devices Branch, located in Building 2640, operates FB-111 and KC-135 aircraft flight simulators for pilot training. Wastes generated in this branch include 60 gal/yr of hydraulic fluid and approximately four unserviceable radioactive beta lamps per year. Hydraulic fluid is turned in to DPDO for recycling, and the lamps are sent to the manufacturer for disposal.

The remaining shops in AMS generate little or no wastes. Small scale use of PD680 cleaning solvent and medical alcohol for occasional cleaning applications employing rags is practiced throughout the shops. Rags are disposed of in trash dumpsters as most of the solvent evaporates after use.

2) Field Maintenance Squadron

The 380th Field Maintenance Squadron (FMS) provides intermediate-level maintenance for the quick repair of aircraft systems and related equipment. The work is accomplished through in-shop repair, specialist dispatch, and local manufacture.

Wheel and Tire Shop. The Wheel and Tire Shop operates in the Black Hangar, Building 2763. Wastes generated include 9201 paint remover (150 gal/yr), PD680 (200 gal/yr), and other miscellaneous solvents in small quantities.

Nondestructive Inspection (NDI) Shop. Nondestructive testing methods are performed to determine material defects on aircraft structures, component parts, and related ground equipment. The NDI shop is located in Building 2802. Wastes generated include PD680 (100 gal/yr), fluorescent dye penetrant (75 gal/yr), emulsifier (100 gal/yr), 7808 engine oil (25 gal/yr), and photographic developers and fixers (55 gal/yr).

Corrosion Control Shop. Corrosion control includes cleaning, stripping, sanding, wiping, priming, repainting, and stenciling aircraft and ground support equipment. The Corrosion Control Shop is located in Dock #8 (Building 2890). Wastes generated in this shop include Turco paint remover (60 gal/yr), methyl ethyl ketone (MEK) (720 gal/yr), Dope and lacquer thinner (120 gal/yr), and polyurethane thinner (120 gal/yr). Other materials such as epoxy primers and lacquer, enamel, and polyurethane paints are consumed in process.

Jet Engine Test Cell. The Jet Engine Test Cell checks the performance of aircraft engines after maintenance operations and prior to installation on the aircraft. This shop is located in Building 2820. Wastes generated include drained JP-4 (600 gal/yr), engine oil and hydraulic fluid (36 gal/yr), and waste solvents and cleaners (60 gal/yr).

Other shops in FMS including Pneudraulics (Building 2753), Machine Shop (Building 2753), Structural Repair Shop (Building 2753), and Jet Engine Conditioning Shop (Building 2774) use various hydraulic, lubricating, and engine oils, and PD680 and MEK solvents. These materials are consumed in operations. Waste JP-4 (36 gal/yr) is the only waste generated by these four shops.

3) Munitions Maintenance Squadron

The 380th Munitions Maintenance Squadron (MMS) is accountable for all munitions related items for base organizations which require explosives to support the wing mission. One branch of this squadron which includes the maintenance operations generates wastes in significant quantities. This branch is the Integrated Munitions Maintenance and Storage Branch (Building 3578). Maintenance operations involve warehousing, inspecting, painting, and cleaning the munitions stored on-base. In addition, lift trailers and other support equipment essential to munitions maintenance, storage, and loading must be serviced. Wastes generated from these operations were estimated by shop personnel and include MEK and toluene (50 gal/yr), oils and lubricants (55 gal/yr), brake fluid (55 gal/yr), and paints and thinners (30 gal/yr). Paint use is approximately 120 gal/yr with most of it being consumed. It was reported that used one and five gallon paint cans may be disposed of in a trash dumpster with small amounts of paints remaining. Insignificant quantities of solvents and oils are used in other areas peripheral to the munitions and equipment maintenance shops.

4) Organizational Maintenance Squadron

The 380th Organizational Maintenance Squadron (OMS) provides operationally ready fighter-bomber and tanker aircraft for all wing missions. The unit also provides minor maintenance, servicing, and inspection of transient aircraft. OMS consists of five branches: alert force, bomber flightline, tanker flightline, support equipment, and technical administration. The alert force is responsible for performing pre-flight inspections and the service, towing, parking, and maintenance and launching of alert craft. The bomber and tanker branches are responsible for periodic inspections and repair of their respective aircraft. Launch, recovery, towing, and parking are routine activities for these branches. The support branch controls and maintains the aircraft support equipment and provides maintenance for transient aircraft. The administration branch controls material supplies. Generation of waste products stems from routine maintenance activities as well as pre- and post-flight servicing such as de-fueling. Wastes generated include contaminated JP-4 (15,600 gal/yr), engine oil (4,400 gal/yr), PD680 (12 gal/yr), and hydraulic fluid (200 gal/yr).

5) Transportation Squadron

The 380th Transportation Squadron provides traffic management, vehicle operation services, and vehicle maintenance. Waste materials are generated only in the vehicle maintenance branch, which is responsible for maintaining all government-owned motor vehicles in serviceable condition. These maintenance activities are performed in Buildings 2540 and 2548. Wastes generated include 10W30 engine oil (3,900 gal/yr), 30W engine oil (1,800 gal/yr), hydraulic oil (300 gal/yr), transmission fluid (300 gal/yr), PD680 (300 gal/yr), lacquer and enamel paint thinners (100 gal/yr), contaminated fuels (240 gal/yr), and battery acid (120 gal/yr). Battery acid is neutralized with baking soda and flushed down the sanitary sewer.

6) Communications Squadron

The 2042 Communications Squadron operates and maintains the base switchboard, message center, and intra-base radio support. It also provides air traffic control services to Plattsburgh and the surrounding area. Maintenance shops in the 2042 Communications Squadron (Building 2738) reported engine turbine oil (72 gal/yr) and contaminated fuel (100 gal/yr) as wastes generated.

7) Flight Training Wing

The 71 Flight Training Wing is responsible for maintenance and support of T-37 aircraft which are used for pilot training at PAFB. The Flight Training Wing operates in Building 2766 and generates contaminated fuels (50 gal/yr), engine lubrication oil (12 gal/yr), and hydraulic oil (3 gal/yr).

8) Non-Contiguous Supporting Sites

The Plattsburgh AFB mission is supported by activities at five small sites which are not contiguous with the main base property. These sites are the TACAN aerial navigation site, Middle Marker visual landing approach site, ILS Marker Beacon site, Annex #1 remote communications receiver site, and the remote communications transmitter site.

The TACAN site, the Middle Marker site, and the ILS Marker Beacon site are small unmanned sites (<5 acres). Each consists of a small building which houses signal generating equipment for aircraft navigational aid. No hazardous wastes are generated at these sites.

The two communications sites are also unmanned. The remote transmitter site was inactivated in 1982 and all of the equipment was removed. Each of the communications sites has an on-site well for non-potable water. The water is used for hand washing and a commode. The sanitary wastewater flows to a septic tank prior to discharge to the ground. No hazardous wastes are generated at these sites.

b. Fuels Management

The Plattsburgh AFB Fuels Management storage and distribution system includes a number of above ground and underground storage tanks and pipelines located throughout the base. Currently, there are 57 active POL tanks and 235 heating oil tanks in the housing area. Table IV-1 is a summary of active fuel storage capacities and approximate daily use where available. A more detailed analysis of fuel storage by tank capacity and fuel type is presented in Appendix F.

Many of the large (10,000 gallon or greater) tanks are within the POL (Petroleum, Oil, and Lubricants) storage area in the east central part of the base. There are three large surface tanks in this area: two JP-4 tanks, and one fuel oil (#2) tank. Also in the POL storage area are two deicing fluid tanks and one tank for isopropyl alcohol. These three tanks are underground.

Fuel oil (#6) is used and stored at the base heating plant located east of the alert area. Storage is in three above ground tanks similar to the POL area surface tanks. Five large MOGAS (leaded and unleaded) and diesel storage tanks are located in the Transportation Squadron's vehicle refueling yard located east and adjacent to the heating plant. Two MOGAS tanks and one diesel tank are above ground. The remaining two tanks are underground.

The bulk of the JP-4 storage tanks are located under pumphouses 1, 2, 5, and 7 on the west side of the flightline ramp. Each of the four pumphouses obtain JP-4 fuel from one of the six 50,000 gallon tanks beneath it for distribution to the laterals under the flightline ramp. The pumphouse tanks are supplied from the two JP-4 surface tanks located in the POL storage yard. Pumphouse 3 was destroyed by an explosion in 1973. Two of its six underground tanks now store contaminated fuel; the remaining four contain fuel oil #2. Pumphouses 4 and 6 are both deactivated, although intact. In the past, they stored 300,000 gallons of AVGAS each but are now empty.

TABLE IV-1. SUMMARY OF ACTIVE POL STORAGE CAPACITIES

Material	Number of Tanks: Above Ground Tanks	Number of Tanks: Below Ground Tanks	Maximum Tank Volume (gal)	Minimum Tank Volume (gal)	Total Storage Volume (gal) (Shell-rated Capacity)	Daily Use (gal)
Mogas	4	5	25,000	275	64,525	1,050
Diesel	3	3	12,142	275	28,755	155
Fuel Oil (#2)[1]	1	4	840,000	50,000	1,040,000	1,700
Fuel Oil (#6)	3	0	420,000	126,840	673,680	15,600
Isopropyl Alcohol	0	1	—	—	25,000	N/A
Deicing Fluid	0	2	25,000	25,000	50,000	6,000*
JP-4	4	27	1,260,000	2,500	3,913,164	100,000

N/A - Not available.

* - Gallons per year.

[1] Does not include heating oil tanks at base housing, communications sites and some industrial areas.

Nine medium size (1,000 to 10,000 gallon) storage tanks are in use on the base. The Aerospace Ground Equipment section maintains a JP-4 and MOGAS tank. The snow barn has MOGAS and diesel fuel tanks to fuel its snow removal and other heavy equipment. A vehicle refueling station outside Building 2815 contains MOGAS and JP-4 tanks. The alert area and Jet Engine Test Cell Shop each have a JP-4 storage tank and the Base Exchange service station has a 7,300 gallon gasoline tank.

Two of the three small size (less than 1,000 gallon) tanks are above ground. These are a MOGAS tank and a diesel tank located in the alert area. The third tank is an underground MOGAS tank used for refueling vehicles at the Weapons Storage Area.

The fuels are delivered to the base and distributed in a variety of ways. JP-4 is piped in underground from Port Douglass, New York, to the two surface storage tanks. JP-4 delivered by truck is also pumped to the storage tanks. From the storage tanks the fuel is piped to the flightline pumphouses and then through laterals to the refueling ports on the flightline ramp. Tanker trucks are used to distribute JP-4 to storage tanks at shops throughout the base. Other fuels such as MOGAS, diesel, and fuel oils are delivered to the base by tanker trucks to central storage tanks. Base tanker trucks then distribute these fuels to industrial shops and the housing areas. Deicing fluid is trucked to the POL storage area by commercial tankers. Air Force trucks equipped with "cherry pickers" are then filled with deicer and water at the proper mixture before proceeding to the nose dock area or flightline for deicing planes.

c. Pesticide Utilization

The Plattsburgh AFB pest control program is conducted by two shops in the Civil Engineering Squadron: Roads and Grounds, and Entomology. The program involves routine and specific job order chemical application and spraying of pesticides. Pesticides are stored in Buildings 426 and 2566.

Pesticides are used primarily for cockroaches, ants, mosquitos, rodent control, tree protection, and weed control purposes. Herbicides are generally applied directly to the ground or sprayed on unwanted weed growth. Pesticides may be applied in pellets, powder, or spray form. For mosquitos and for a recent gypsy moth problem, a hydraulic sprayer applies the insecticide directly to the air as a fog. The principal chemicals used are malathion (1,260 lb/yr), Pramitol 5PS (480 lb/yr), Round-up (212 lb/yr), Bromacil (62 lb/yr), 2-4D (40 lb/yr), Dursban (30 lb/yr), Sevin (7 lb/yr), Diazinon (6 lb/yr), and Hydrocyanide, Avitrol and Calcium cyanide (1 lb/yr each).

No pesticides are presently disposed of. Small quantities are mixed for specific jobs and are used up either the same day or within the next two days. Empty containers are triple rinsed and thrown out in regular trash or turned in to DPDO for salvaging.

d. Base Hospital and Laboratory Operations

Plattsburgh AFB operates a 20-bed composite medical facility which provides clinical and dental services to base personnel. A number of hazardous materials are used by the hospital in routine operations. Each office or lab utilizing hazardous materials in its activities is individually responsible for proper handling, storage, and disposal of used or excess supplies.

Until five years ago, pathological wastes were disposed of through on-site incineration. Presently, such material is taken to a hospital in Plattsburgh and incinerated. Infrequently, hazardous wastes are generated by the hospital and turned in to DPDO for disposal.

2. Description of Waste Disposal Methods

Plattsburgh AFB has used a variety of disposal methods for wastes since its inception in 1955. No information is available on waste disposal methods of the installation when it was under the control of other branches of

the Armed Forces. Activities prior to 1955 are unknown. Table IV-2 presents the shops that generate hazardous wastes, waste quantities, and disposal method timelines.

Refuse generated at Plattsburgh AFB includes paper, garbage, glass, metal, and other components of general municipal refuse. Refuse was disposed of on base in sanitary landfills from 1955 to 1979. Four different landfill areas have been used, three of which involved open pit burning of trash prior to burial at the end of each day. Currently, refuse is deposited in dumpsters located throughout the base and is contract hauled to a municipal landfill site.

Construction debris consisting of wood, concrete, asphalt, wire, and other construction materials have been disposed of at several sites. Presently a small scale construction spoils dump site is in use.

Small amounts of hazardous wastes may have been disposed of in the landfills over the history of on-base landfilling. Interviews with present and former base personnel revealed that occasionally waste paints in small quantities were disposed of in the landfills. Drums and containers believed to be empty were also dumped in the landfills. These may have contained solvents, oils, or other hazardous substances.

Interviewees indicated that since the base began operations in 1955 standard operating procedures have excluded disposing of hazardous waste materials by landfilling. Generated wastes, such as spent solvents, cleaners, oils, thinners, etc. are accumulated at the shops in 55-gallon drums, slop waste tanks, and bowsers. Since 1982, these wastes have been turned in to DPDO and disposed of to a hazardous waste contractor. From 1978-82, the waste was disposed of off-base through a CE service contract. From 1970-78, it is believed that wastes were disposed off-base through a CE service contract. Prior to 1970, the method of waste disposal is uncertain.

TABLE IV-2. INDUSTRIAL OPERATIONS (SHOPS), ASSOCIATED WASTES AND DISPOSAL METHODS, PLATTSBURGH AFB

Shop Name	Location (bldg. no.)	Waste Material	Annual Waste Quantity	Method(s) of Treatment, Storage and Disposal 1955 1960 1970 1980 1982 1985
380th Avionics Maintenance Squadron (AMS)				
Precision Measurement Equipment Laboratory	2801	Mercury	5 lbs	Recycled off-base, CE; Recycled off-base, CE; Recycled off-base, DPDO
Aircrew Training Devices Branch	2640	Hydraulic Fluid	60 gal	Disposed off-base, CE; Disposed off-base, CE; Disposed off-base, DPDO
		Unserviceable Radioactive Beta Lamps	4 lamps	Returned to Manufacturer; Returned to Manufacturer
380th Field Maintenance Squadron (FMS)				
Wheel and Tire Shop	2763	Turco Paint Remover PD680	150 gal 200 gal	Disposed off-base, CE; Disposed off-base, CE; Disposed off-base, DPDO
Nondestructive Inspection Shop	2802	PD680 Fluorescent Dye Penetrant Emulsifier 7808 Engine Oil Photographic Developers and Fixers	100 gal 75 gal 100 gal 25 gal 55 gal	Disposed off-base, CE; Disposed off-base, CE; Disposed off-base, DPDO
Corrosion Control Shop	2890	Turco Paint Remover MEK Dolpen Lacquer Thinner Polyurethane Thinner	60 gal 720 gal 120 gal 120 gal	Disposed off-base, CE; Disposed off-base, CE; Disposed off-base, DPDO
Jet Engine Test Cell	2820	JP-4 Engine Oil and Hydraulic Fluid Solvents and Cleaners	600 gal 36 gal 60 gal	Recycled on-base, Fire Training; Recycled on-base, Fire Training

TABLE IV-2. INDUSTRIAL OPERATIONS (SHOPS), ASSOCIATED WASTES AND DISPOSAL METHODS, PLATTSBURGH AFB (Continued)

Shop Name	Location (bldg. no.)	Waste Material	Annual Waste Quantity	Method(s) of Treatment, Storage and Disposal 1955 1960 1970 1980 1982 1985
Pneudraulics Shop	2753	JP-4	36 gal	Recycled on-base, Fire Training; Recycled on-base, Fire Training
Structural Repair Shop	2753			
Jet Engine Conditioning Shop	2774			
380th Munitions Maintenance Squadron (MMS)				
Integrated Munitions Maintenance and Storage Branch	3578	MEK and Toluene	50 gal	Disposed off-base, CE; Disposed off-base, CE; Disposed off-base, DPDO
		Oils and Lubricants	55 gal	
		Brake Fluid	55 gal	
		Paints and Thinners	30 gal	
380th Organizational Maintenance Squadron (OMS)	2895,2793 2763,2714 and 2786	JP-4	15,600 gal	Recycled on-base, Fire Training; Recycled on-base, Fire Training
		Engine Oil	4,400 gal	
		PD680	12 gal	
		Hydraulic Fluid	200 gal	
380th Transportation Squadron	2540 and 2548	10W30 Engine Oil	3,900 gal	Disposed off-base, CE; Disposed off-base, CE; Disposed off-base, DPDO
		30W Engine Oil	1,800 gal	
		Hydraulic Oil	300 gal	
		Transmission Fluid	300 gal	
		Lacquer and Enamel Paint Thinners	100 gal	
		PD680	300 gal	Recycled on-base, Fire Training; Recycled on-base, Fire Training
		Contaminated Fuels	240 gal	
		Battery Acid	120 gal	Neutralized, Sanitary Sewer

TABLE IV-2. INDUSTRIAL OPERATIONS (SHOPS), ASSOCIATED WASTES AND DISPOSAL METHODS, PLATTSBURGH AFB (Continued)

Shop Name	Location (bldg. no.)	Waste Material	Annual Waste Quantity	Method(s) of Treatment, Storage and Disposal (1955 1960 1970 1980 1982 1985)
2042 Communications Squadron	2738	Engine Turbine Oil	72 gal	Disposed off-base, CE (to 1970); Disposed off-base, CE (1970–1982); Disposed off-base, DPDO (1982–)
		Contaminated Fuel	[illegible]	Recycled on-base, Fire Training (to 1980); Recycled on-base, Fire Training (1980–)
71 Flight Training Wing	2766	Contaminated Fuels Engine Lubrication Oil Hydraulic Oil	50 gal 12 gal 3 gal	Disposed off-base, CE (to 1970); Disposed off-base, CE (1970–1982); Disposed off-base, DPDO (1982–)

KEY:

———— Confirmed time frame

- - - - - Estimated time frame

DPDO Defense Property Disposal Office

CE Civil Engineering Service Contract

The primary purpose of fire training exercises is to train firemen in the methods of fighting fires. The materials that are burned during these exercises are waste oils, PD680, and contaminated fuels generated by industrial shops on the base. In the past, other solvents may also have been burned in fire training exercises.

Incineration of hazardous materials on base is not practiced. The base hospital incinerator for pathological tissues and cultures has not been used in five years. One other incinerator on base is used for disposal of classified documents.

Disposal of spilled material depends on the spill size. Large spills are contained if possible and the material is collected in bowsers or drums. Smaller spills may be cleaned up with absorbent material which is burned at the fire training area. Occasionally, spills have been washed down with water and entered the base storm drainage system. Spills in industrial shops equipped with oil/water separators have also been washed down. Aircraft deicing fluid and roads and pavement deicer have been allowed to run off with snowmelt and entered the drainage system. Sanitary sewers have been used for disposal of small quantities of wastes such as rinses from pesticide containers, caustics and acids after neutralization.

Prior to the 1970s, hazardous wastes were probably disposed of using techniques similar to those currently employed. Interviews with base personnel and review of base records failed to identify consistent methods of hazardous waste disposal. Some incidents recounted by the interviewees could not be verified by other independent sources.

B. Disposal Site Identification, Evaluation, and Hazard Assessment

As a result of Phase I activities at Plattsburgh AFB and five additional sites not contiguous with the base, 22 sites/areas of potential

environmental concern were identified. The sites have been divided into five major groupings:

- Landfill sites,
- Fire training sites,
- Hazardous waste accumulation sites,
- Chemical spill sites, and
- Wastewater disposal.

In the following sections, each of the sites is described in greater detail. Based on the information available, a determination of the potential for hazardous chemical migration from the site was made. Those sites determined to pose a significant potential threat to human health and the environment via migration of hazardous constituents resulting from past operations were analyzed using the Hazard Assessment Rating Methodology (HARM). The Decision Tree logic used to determine whether each site should proceed to the HARM rating step is outlined in Table IV-3.

Screening of the original 22 sites resulted in 13 sites progressing to the HARM model ranking step. These sites, along with their HARM scores, are listed in Table V-1 (Conclusions). The remaining sites, though they were determined to require no further study in their present condition, still represent potential environmental concerns. If future activities will disrupt any of these sites, their potential for environmental impact should be reevaluated in light of planned activities.

1. Landfill Sites

Throughout its history, Plattsburgh AFB has used seven different areas on base for surface disposal of solid wastes. The locations of all landfills identified in this study are shown on Figure IV-1. The sites are described briefly in Table IV-4.

TABLE IV-3. SUMMARY OF DECISION TREE LOGIC FOR ALL SITES IDENTIFIED IN THE PLATTSBURGH AFB PHASE I STUDY

Site Number	Description	Potential for Contamination by Hazardous or Toxic Materials	Potential for Contaminant Migration	Rate Using HARM
D-1	Landfill, vicinity of Capehart housing	No	No	No
D-2	Landfill, northwest tip of PAFB	No	No	No
D-3	Landfill, southeast of small arms range	No	No	No
D-4	Landfill, south of fire training area	Yes	Yes	Yes
D-5	Rubble area, southwest corner of PAFB	No	No	No
D-6	Explosive ordnance disposal, southwest corner of PAFB	No	No	No
D-7	Munitions residue dump, adjacent to D-3 site	No	No	No
FT-1	Fire training area, southeast of small arms range	Yes	Yes	Yes
FT-2	Structural fire training area, Building 3410	No	No	No

TABLE IV-3. SUMMARY OF DECISION TREE LOGIC FOR ALL SITES IDENTIFIED IN THE PLATTSBURGH AFB PHASE I STUDY (Continued)

Site Number	Description	Potential for Contamination by Hazardous or Toxic Materials	Potential for Contaminant Migration	Rate Using HARM
SP-1	PCB spill, DPDO salvage yard	No	No	No
SP-2	Number 2 fuel oil spill, near Building 205	Yes	Yes	Yes
SP-3	JP-4 and solvent spills, SAC flightline ramp and adjacent industrial area	Yes	Yes	Yes
SP-4	Heating oil spill, heating plant (Building 2658)	No	No	No
SP-5	JP-4 spill, southeast section of flightline ramp	Yes	Yes	Yes
SP-6	JP-4 spills, AF vehicle maintenance (Building 2542)	Yes	Yes	Yes
SP-7	Number 2 fuel oil spill, behind DPDO office (Building 1810)	Yes	Yes	Yes
SP-8	Fuel spills, POL storage area	Yes	Yes	Yes

TABLE IV-3. SUMMARY OF DECISION TREE LOGIC FOR ALL SITES IDENTIFIED IN THE PLATTSBURGH AFB PHASE I STUDY (Continued)

Site Number	Description	Potential for Contamination by Hazardous or Toxic Materials	Potential for Contaminant Migration	Rate Using HARM
SP-9	Solvent spills, MMS industrial complex north of WSA	Yes	Yes	Yes
SP-10	JP-4 spills, alert flightline ramp	Yes	Yes	Yes
SP-11	Engine oil spills, New Base housing area	Yes	Yes	Yes
SP-12	Storage area, northwest corner of Building 2890	Yes	Yes	Yes
SP-13	Accumulation area, southeast corner of build-ing 2774	Yes	Yes	Yes

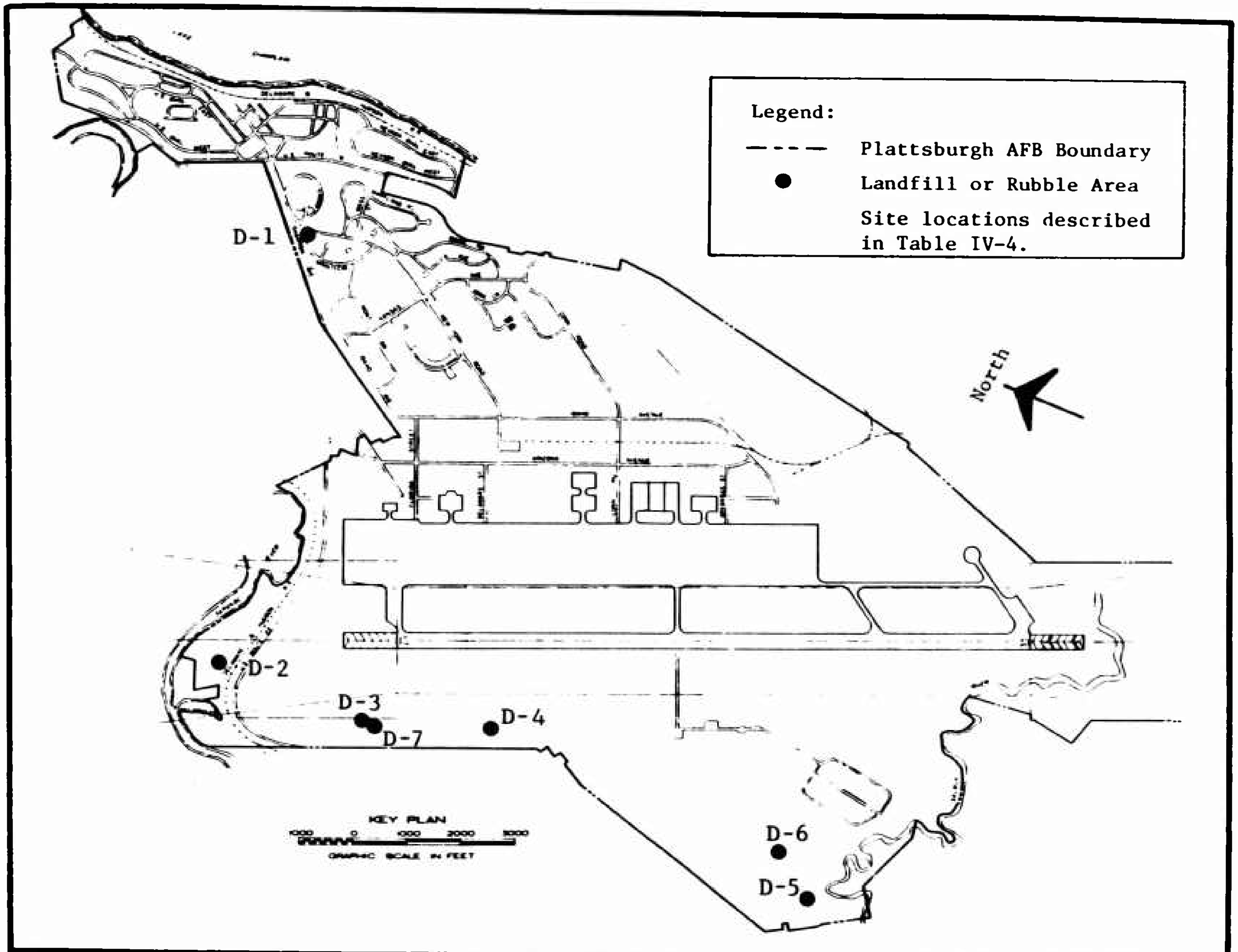


Figure IV-1. Locations of Landfills and Rubble Areas, Plattsburgh AFB, New York

TABLE IV-4. IDENTIFIED AREAS OF POTENTIAL ENVIRONMENTAL CONTAMINATION FROM LANDFILLS AT PLATTSBURGH AFB, NEW YORK

Site Number	Description	Site Status*
D-1	Landfill, vicinity of Capehart housing (1955-1956)	I
D-2	Landfill, northwest of PAFB (1956-1959)	I
D-3	Landfill, southeast of small arms range (1959-1966)	I
D-4	Landfill, south of fire training area (1966-1979)	I
D-5	Rubble area, southwest corner of PAFB	A
D-6	Explosive ordance disposal, southwest corner of PAFB	A
D-7	Munitions residue dump, adjacent to D-3 site	A

*I = Inactive; A = Active

The types of wastes which have been landfilled are very diverse. However, to facilitate characterization of individual sites, the following broad classification of waste types may be used:

Construction wastes - consist of asphalt, concrete, and demolition rubble. A potentially hazardous component, asbestos, should not be a problem unless disturbed.

Domestic wastes - consist of paper, cans, glass, and other miscellaneous trash. Although hazardous materials may be included, they should be in minute quantities and constitute limited problems. A potential problem could be the formation of methane and hydrogen sulfide from the anaerobic decomposition of materials, particularly if garbage is present.

Hazardous and potentially hazardous wastes - consist of spent acids, bases, pesticides, solvents,fuels and oils. Many of these materials have the potential for migration.

Sludges - consist of solid material settled from wastewaters with or without chemical addition to induce precipitation. Sludges may also comprise those materials skimmed from the surface of wastewater such as floating organic debris, solvents, or oils and greases. A potential problem with sludges may be the presence of heavy metals in chemically precipitated solids, or toxic organics in sludges generated from surface skimming.

a. Site D-1 Landfill, Vicinity of Capehart Housing

This site was an active construction and domestic waste landfill from 1955 to August 1956. At this time the new base was under construction. The population on the base was reportedly less than 100 people, therefore the quantities of domestic wastes landfilled at this site were not great. Industrial operations were not fully underway so there was little likelihood of disposal of hazardous materials in this landfill. The disposed material was

burned in trenches prior to being covered. The site was closed in 1956 because growth of the base necessitated using the land for housing development.

This site was not rated using HARM since all available evidence suggests that no hazardous wastes were disposed of at this site. There are no environmental concerns at this site since construction wastes and all domestic wastes were burned at the site.

b. Site D-2 Landfill, Northwest Tip of PAFB

This landfill was activated in August 1956 and used until June 1959. It is located on the north side of Route 22, between the railroad tracks and the Saranac River, approximately in line with the instrument runway. The site is not extensive in size, less than 80 yards long and 40 to 50 yards wide. The landfill was used for domestic wastes and wastewater treatment sludge which was burned in the trenches daily prior to being covered with sand. Interviews with persons who had been involved with landfill activities did not reveal evidence of hazardous waste material dumping in this landfill.

Sludge from the industrial waste treatment plant (Building 2887) was landfilled at this site. The industrial waste treatment plant included a Gibbs flotation unit, a flocculator, and skimmer, and was in operation until the early 1960s. The source of wastewater to the plant was from two aircraft wash racks. The treatment system was designed to remove oils, grease, and fuel residues, as well as aircraft cleaning compound residues. The floc and the skimmed residue was disposed in the landfill, and the effluent was discharged to the sanitary sewer. Use of this treatment plant was discontinued when a detergent cleaner replaced the aircraft cleaning compound, and a new wash rack constructed in the Black Hangar was equipped with an oil/water separator.

This site was not rated using HARM because there is no evidence that a potential for contamination exists at this site. Domestic waste presents no problems, no evidence was available to substantiate dumping of waste oils, solvents, or fuels, and sludge dumping is not considered serious in this case because the dumped material was burned prior to landfilling.

c. Site D-3 Landfill, Southeast of Small Arms Range

This site was an active landfill from 1959 to 1966 and received domestic wastes only. The landfill is located about 1,000 feet west of the instrument runway's northern overrun, and adjacent to the southeast end of the small arms range. The landfill is approximately 500 feet wide and 1,200 feet long. Operation of the landfill included digging 25 foot deep trenches, spreading and burning the trash in the trenches, and backfilling with sandy soil daily. Information from base personnel who were interviewed did not disclose evidence of hazardous material dumping in this landfill. However, operators did recall seeing empty drums and containers in the landfill at times, but indicated that these were unsalvageable drums that could not be taken elsewhere.

There is no evidence of hazardous material disposal at this site. Thus, this site was not rated using the HARM model.

d. D-4 Landfill, South of Fire Training Area

This site was the last active domestic waste landfill operated on the base. The landfill operation included digging 25 foot deep trenches, spreading and compacting the trash, and backfilling with a six inch layer of sandy soil daily. The landfill is south of and adjacent to the fire training area, and is 1,500 feet from the instrument runway. The area is about 500 feet wide and 1,000 feet long. The landfill was in operation from 1966 to 1979 when it was permanently closed. Since 1979 the base has had a contract for off-base disposal of domestic wastes.

Present and former base personnel who worked the landfill indicated hazardous, organic (such as animals or large amounts of spoiled food), or radioactive wastes were not routinely disposed in this landfill. One person reported compacting two 55-gallon drums which when punctured sprayed a liquid material onto the tractor. Based on the effect the liquid had on the tractor, the person surmised the drums held paint remover. No verification of this incident was obtained from other sources.

Since there are suspected incidences that may have led to contamination of this landfill by hazardous materials, the HARM model rating was applied to this site. The site received a HARM score of 62.

e. D-5 Rubble Area, Southwest Corner of PAFB

Plattsburgh AFB has used many locations for disposing of construction wastes since its initial phase of construction in 1955. One of these sites has been identified (D-1) but the others are not specifically documented. The present construction waste dumping area is about 500 to 700 feet from the base boundary in the southwest part of the base.

Since no evidence of environmental contamination was discovered during the site inspection and base interviews, Site D-5 was not rated using the HARM model.

f. D-6 Explosive Ordnance Disposal, Southwest Corner of PAFB

The explosive ordance disposal (EOD) area is located adjacent to the rubble area (Site D-5) and approximately 1,000 feet from the base boundary. On the east side, the WSA is about 1,200 feet away. The EOD area has been used for detonation of conventional munitions. Also, firefighters have been trained about the size and effects of various types of explosives. Reportedly, no hazardous materials were buried here.

No indications of environmental contamination from hazardous waste were discovered from interviews with base personnel. Therefore, this site was not rated using the HARM model.

g. D-7 Munitions Residue Dump, Within the Boundaries of Site D-3

A dump for munitions residues is located within the boundaries of Site D-3. Here munitions or any explosive device that has been deactivated or detonated are buried for final disposal. The dump is operated by MMS which has final responsibility for any explosive material or device on the base. Site inspection revealed a large assemblage of spent engine starter cartridges dumped in a ditch along a dirt road leading through the old landfill site. The engine starter cartridges are used to start alert force aircraft engines by some means of explosion so that the normal engine starting time requirement is shortened. These cartridges are reported to give off carbon monoxide and hydrogen cyanide gases when used, and flight support personnel are required to wear gas masks when using the cartridges. No evidence of hazardous waste disposal was uncovered in the munitions dump area.

Since no evidence of environmental contamination was discovered during the site inspection and base interviews, Site D-7 was not rated using the HARM model.

2. Fire Training Sites

Fire fighting training and experience is gained by having installation fire fighting crews routinely set and extinguish controlled fires. These fires are started using waste fuel and other flammables from the base. Waste JP-4 mixed with no more than 10 percent waste oils is currently the material used. Waste solvents have been used, though always mixed with JP-4. Two active fire training sites have been identified and are shown in Figure IV-2. The sites are discussed below along with typical fire training exercises conducted at the sites.

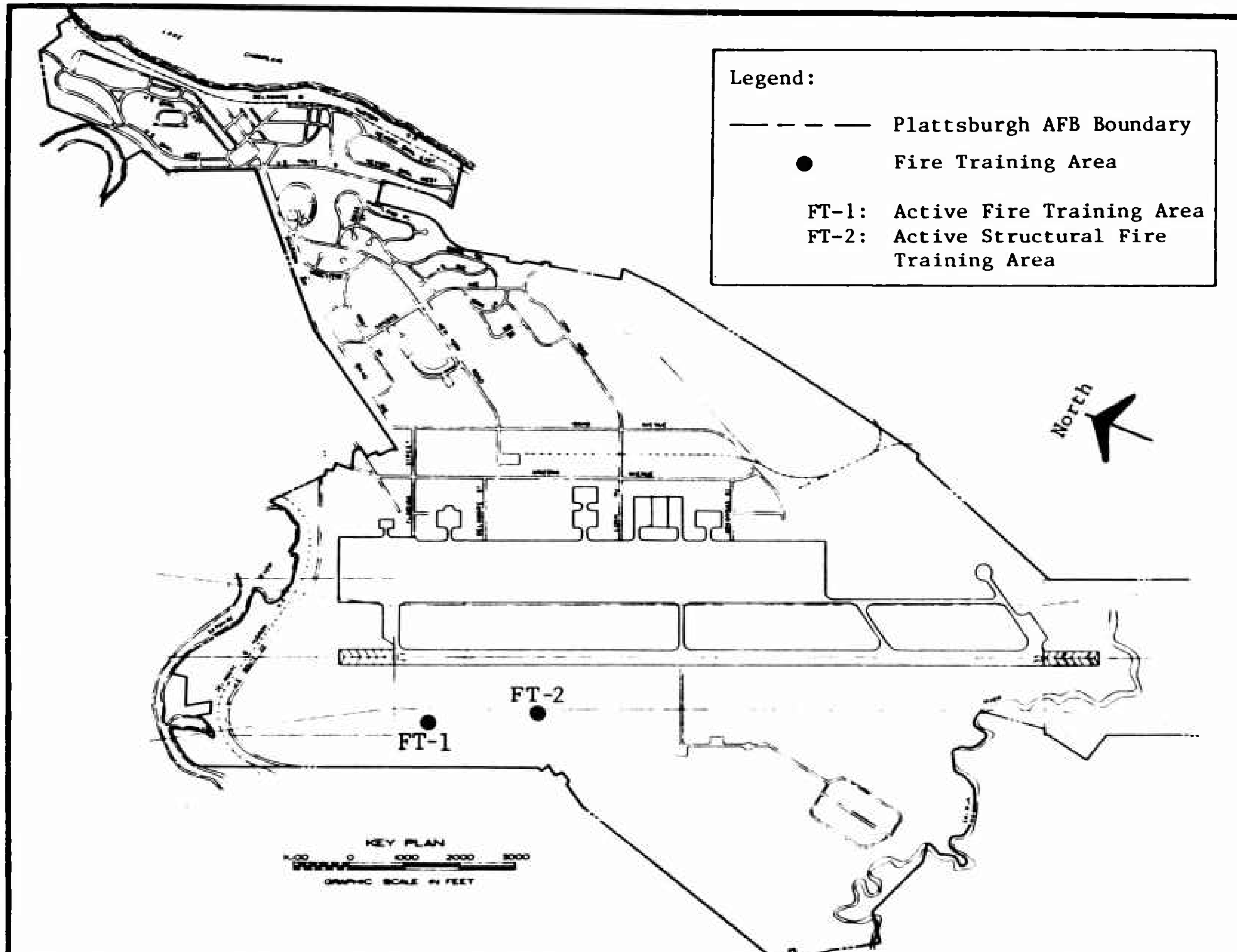


Figure IV-2. Locations of Fire Training Areas, Plattsburgh AFB, New York

a. Site FT-1, Fire Training Area

This site encompasses three fire training pits which have been used since the inception of fire training activity on the installation. The pits are located southeast of the small arms range, directly across the runway from the alert aircraft hangars, and between two old landfills. One of the three pits was deactivated in 1980 because of drainage problems. The two active fire training pits were unlined until 1980 when a bentonite liner was constructed. However, the liner reportedly leaks on the order of thousands of gallons per day when filled with water. A project is scheduled for May 1985 to evaluate and replace the liner if necessary.

Prior to 1980, the fire pits consisted of sand and gravel. Waste fuel would be dumped on the ground and ignited. Inevitably some of the fuel would soak into the ground and not be consumed by the fire. The quantity of waste fuel that may have leached into the ground in this way is inestimable.

In the past, fire training exercises were conducted on a weekly basis. A maximum of 2,000 gallons of fuel was burned per day of fire training. For a fire training exercise 10,000 gallons of water were used to fill a fire pit. Then 75 to 100 gallons of fuel were poured on the water and ignited. The fire was extinguished with water, and then reignited and extinguished four or five times. Residual unburned fuels may have totalled 30 to 40 gallons per day of fire training. This fuel probably seeped into the ground as the water percolated through the leaking bentonite liner.

This site was rated using the HARM model since it is known to be a source of hazardous materials contamination and because of the potential for contaminant migration. The HARM score for this site is 66.

b. Site FT-2, Structural Fire Training Area

The structural fire training area is located south of the fire training pits in Building 3410. Training is conducted in the two-story concrete block building by igniting wood and straw fires and extinguishing them

with water. A 5,000 gallon concrete collection basin is adjacent to the training structure and collects runoff from the fire fighting exercise. This basin is pumped dry after each exercise; the pumped water is applied to the surrounding area and percolates into the ground.

No evidence of environmental contamination was uncovered during the site visit and interviews. The only materials burned at this site are wood and straw. Flammable liquids may be sprayed on the wood to aid ignition. Quantities of flammables thus used would be small and entirely consumed by the fire. Therefore, this site was not rated using the HARM model.

3. Hazardous Waste Accumulation Sites

There are 10 hazardous waste accumulation sites located on Plattsburgh AFB. Two of these sites have been identified as chemical spill sites and will be discussed below in Section IVB.4. For the other eight accumulation sites no spills were reported and no evidence of environmental contamination was uncovered during the data review or in interviews.

4. Chemical Spill Sites

Small spills have occurred at various shops and facilities on Plattsburgh AFB. These spills are generally cleaned up quickly and do not have significant environmental impact. Typical of these are small shop spills which are wiped up with rags or absorbent material. Small spills can also be expected from routine engine maintenance, accidental overfilling of tanks, off-loading of fuel trucks, and as a consequence of fuel expansion in the aircraft fuel tanks.

Thirteen chemical spills were reported during interviews with base personnel. The locations of these spill sites are illustrated in Figure IV-3. The spill sites are listed and described briefly in Table IV-5.

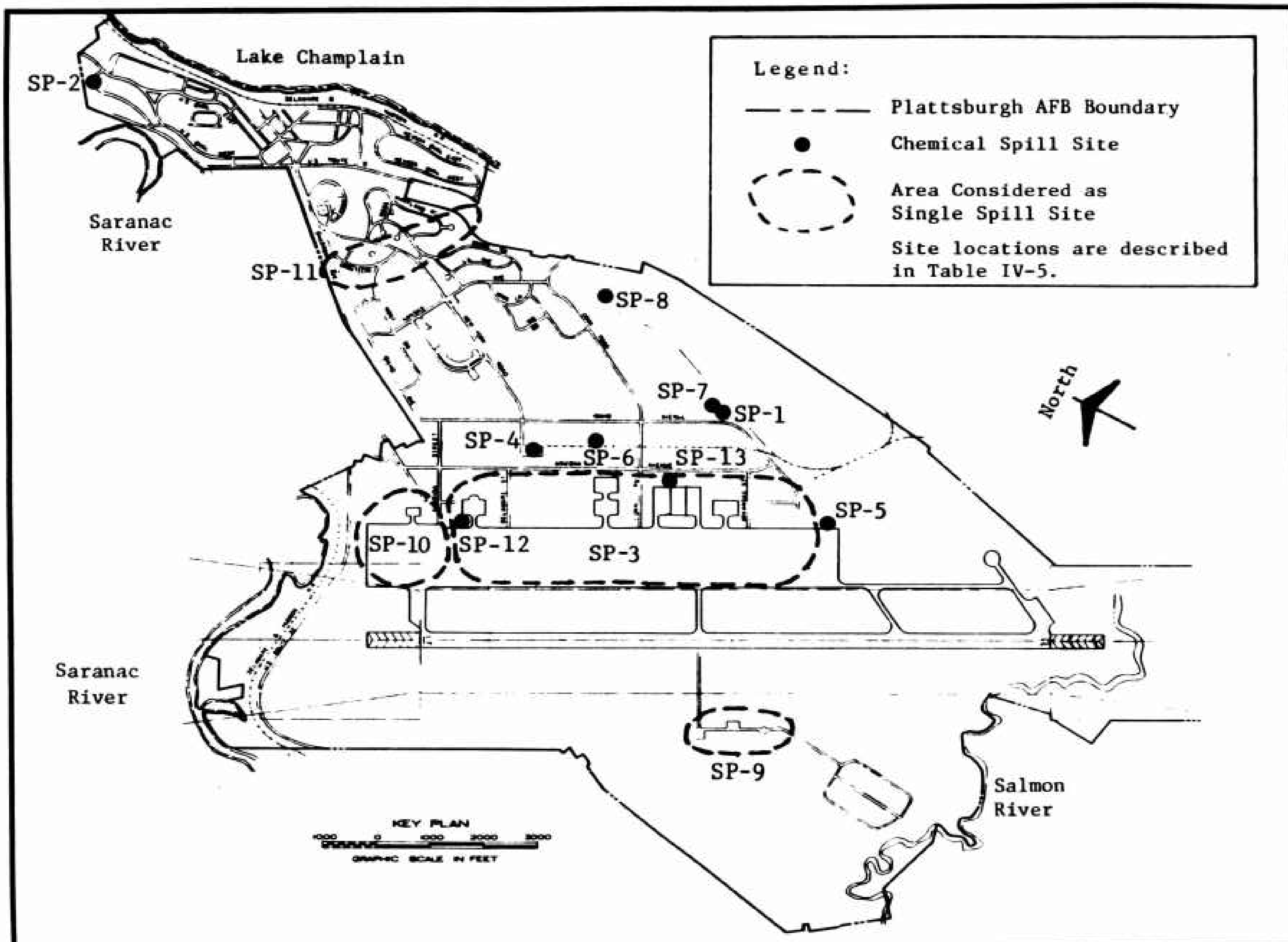


Figure IV-3. Locations of Chemical Spill Sites, Plattsburgh AFB, New York

TABLE IV-5. IDENTIFIED AREAS OF POTENTIAL ENVIRONMENTAL CONTAMINATION FROM CHEMICAL SPILLS AT PLATTSBURGH AFB, NEW YORK

Site Number	Description	Site Status*
SP-1	PCB spill, DPDO salvage yard	I
SP-2	Number 2 fuel oil spill, base housing heating fuel tank adjacent to Building 205	I
SP-3	JP-4 and solvent spills, SAC flightline ramp and adjacent industrial area	A
SP-4	Heating oil spill, heating plant Building 2568	I
SP-5	JP-4 spill, southeast corner of SAC flightline ramp	I
SP-6	JP-4 spills, AF vehicle maintenance Building 2542	I
SP-7	Number 2 fuel oil spill, behind DPDO office	I
SP-8	Fuel spills, POL storage area	A
SP-9	Solvent spills, MMS industrial complex north of WSA	A
SP-10	JP-4 spills, alert flightline ramp	A
SP-11	Engine oil spills, New Base housing area	A
SP-12	Storage of new product drums, northwest corner of Building 2890	A
SP-13	Spent and new product drum accumulation, outside Building 2774	A

*I = Inactive; A = Active

a. Site SP-1, PCB Spill in DPDO Salvage Yard

In 1981, 39 gallons of PCB contaminated transformer fluid spilled in the DPDO salvage yard. The PCB transformer was sitting in the yard when a forklift backed into it. The spill occurred during winter, thus the ground was frozen and covered with ice. The spilled fluid remained on top of the ice and was contained and properly cleaned up. When the ground thawed, it was excavated and tested by the Air Force for PCBs but no trace was discovered.

Since no evidence exists to suggest potential for environmental contamination at this site, this site was not rated using HARM.

b. Site SP-2, Number 2 Fuel Oil Spill from Base Housing Fuel Tank

In 1982, a leak was detected in an underground heating fuel tank adjacent to Building 205. Evidence of fuel had been found by state officials at a base sewer outfall discharging to the Saranac River. The fuel tank had split and leaking fuel was flowing into an underground tile drain designed to regulate the level of ground water in the area. The tile drain discharges to a storm sewer.

Base personnel estimated that around 1,000 gallons of fuel was lost before the problem was discovered. The tank was replaced. For a period of time after the spill absorbent pads and booms were placed in the sewer to collect fuel draining from the ground. Presently there is no evidence of discharge of fuel from this source; however, it is not known whether all the leaked fuel has been drained or if residual amounts are held in the soil matrix or are contaminating the ground water.

Since evidence of a leak of potentially hazardous material was uncovered during data review and through interviews, the potential for environmental contamination at this site was rated using HARM. Site SP-2 received a HARM score of 54.

c. Site SP-3, JP-4 and Solvent Spills, SAC Flightline and Industrial Area

Fuel spills have occurred frequently on the SAC flightline ramp resulting from fueling, de-fueling, and fuel expansion in aircraft fuel tanks. On the average three to four gallons of fuel were spilled daily. These spills were small and the fuel was not recovered. Larger spills have occurred and were of such magnitude (>50 gallons) that some fuel was recovered.

Solvent spills have occurred in the industrial complex adjacent and on the east end of the flightline ramp. These spills were not as regular and numerous as the fuel spills on the flightline ramp. Waste materials spilled on pavements outside shops, leaking or overfilled waste drums stored outside, and stormwater runoff from new and waste product accumulation areas have contributed to contaminants entering storm sewers which discharge to surface waters.

Fuel spills and solvent spills which occurred in the flightline ramp and industrial area reached storm sewers and were discharged to a system of drainage ditches and retention ponds located throughout the base golf course. These channels are designed for drainage of stormwater runoff from the flightline ramp and industrial area, and modified to provide treatment of stormwater with solids settling and skimming of surface oil, grease, and fuel residuals. Skimming is accomplished with floating oil absorbent booms placed across a channel or at the discharge end of a retention pond. Absorbent booms are presently replaced twice a year and checked in the event of a major spill that might drain into the channels. Flow in this system is supplemented by ground- water discharge during dry weather so that a daily average flow is approximately 0.3 million gallons.

Four water quality monitoring locations, 0159-NS-002, -003, -005, and -006, in the golf course drainage system, were sampled monthly for a six month period by the base bioenvironmental engineer. Descriptions of the sampling locations and tables of the analytical data are provided in Table

IV-6. Organic constituents detected in the surface channels in the microgram per liter range include MEK, methylene chloride, 1,2-dichloroethane (DCE), ethylbenzene, and trichloroethylene (TCE). The New York State Department of Environmental Conservation has also collected samples of golf course drainage water. Sample points and results are tabulated in Table IV-7.

Since evidence was obtained indicating potential environmental contamination from this site, Site SP-3 was rated using the HARM model. However, it must be noted that the HARM model is designed specifically for single source spills. In order to rate this site where spills occur in various places, an area was chosen in the center of the flightline ramp from which the HARM determinations were made. Site SP-3 received a HARM score of 79.

d. Site SP-4, Heating Oil Spill, Heating Plant

In 1980, 1,000-2,000 gallons of heating fuel leaked from a broken valve in the heating plant. Personnel interviewed reported that pressure in a line was too great and the valve burst. Because of the pipe configuration, the leak was not discovered immediately. Conflicting information was obtained as to the duration of the leak, but it apparently lasted for more than one day. The spilled material flowed into a floor drain that discharged to the sanitary sewer. The valve was replaced with a new model that is more sensitive in detecting leaks in the pipeline.

Since no evidence of environmental contamination was uncovered during data review and in interviews, this site was not rated using HARM.

e. Site SP-5, JP-4 Spill, Southeast Corner of SAC Flightline Ramp

In August 1984, a problem arose during maintenance of an underground JP-4 distribution pipeline isolation valve. Fuel drained out of the pipeline into the concrete valve pit. As the pit began to fill, bowsers were brought

TABLE IV-6. WATER QUALITY MONITORING DATA, PLATTSBURGH AFB

Sample Site	Sample Date	Volatile Halocarbons (g/l)		Volatile Aromatics (g/l)		Oils and Grease (mg/l)	Ethylene Glycol (mg/l)	Phenols (g/l)	pH
0159-NS-001 Storm drain effluent from golf course streams	*								
0159-NS-002 First holding pond in golf course stream	06/84	Chloroform TCE Tetrachloroethylene Methylene chloride	2.1 0.8 <0.2 <0.2	MEK	3.9	0.36	--	<10	7.8
	07/84	ND		ND		2.5	<10	<10	8.2
	08/84	1,2-dichloroethane Methylene chloride	1.4 0.5	ND		<0.3	121	<10	8.0
	09/84	--		--		BIT	<10	<10	8.4
0159-NS-003 Golf course stream	06/84	Methylene chloride TCE	0.5 0.3	MEK p-Xylene	34 1.2	<0.3	--	<10	7.8
effluent, exit point	07/84	ND		ND		BIT	--	<10	8.0
just upstream of railroad	08/84	1,1-dichloroethane Methylene chloride	1.0 0.4	ND		1.8	26	<10	8.2
bridge	09/84	--		--		0.3	--	20	8.3
0159-NS-004 WSA/Salmon	06/84	Methylene chloride	0.5	ND		<0.3	--	--	7.8
River, SQ boundary,	07/84	ND		ND		<0.3	--	--	8.2
effluent from WSA area and flightline drainage	08/84	1,2-dichloroethane Methylene chloride TCE 1,1,1-trichloroethane	0.5 7.0 0.7 0.7	Benzene Toluene	1.6 5.3	<0.3	--	--	8.0
	09/84	--		--		3.1	--	--	8.3

TABLE IV-6. WATER QUALITY MONITORING DATA, PLATTSBURGH AFB (Continued)

Sample Site	Sample Date	Volatile Halocarbons (g/1)	Volatile Aromatics (g/1)	Oils and Grease (mg/1)	Ethylene Glycol (mg/1)	Phenols (g/1)	pH
0159-NS-005 Holding pond for maintenance facilities effluents, east of Hole 3 tee	06/84	TCE 0.2	MEK 3.9	<0.3	—	<10	7.8
	07/84	ND	ND	0.8	—	10	8.0
	08/84	Trans 1,2-dichloroethene 0.6 Methylene chloride 0.3 TCE 0.3	Ethylbenzene 2.4	4.3	—	<10	8.0
	09/84	—	—	1.4	—	24	8.0
0159-NS-006 Off-base drainage/ stream influent to golf course, SE boundary near Fairway #7	06/84	Methylene chloride 0.2	ND	<0.3	—	<10	7.8
	07/84	ND	ND	5.0	<10	<10	7.6
	08/84	1,2-dichloroethane 1.0 Methylene chloride 1.3 TCE 0.7	—	<0.3	<10	16	8.0
	09/84	—	—	4.5	<10	<10	8.3
0159-NS-007 Alert facility area NW of FB-111 shelters, potential fuel spill effluent only, sample site off-base at Saranac River outfall	No samples taken to date						

TABLE IV-6. WATER QUALITY MONITORING DATA, PLATTSBURGH AFB (Continued)

Sample Site	Sample Date	Volatile Halocarbons (g/l)	Volatile Aromatics (g/l)	Oils and Grease (mg/l)	Ethylene Glycol (mg/l)	Phenols (g/l)	pH
0159-NS-008 Bulk storage facility (near east gate), potential spill effluent only							
Upstream of Boom	05/22/84	--	--	228	--	--	--
Downstream of Boom	05/22/84	--	--	6.4	--	--	--
Just Outside Berm	05/22/84	--	--	6.7	--	--	--
	09/15/84	BIT					

ND - None detected

BIT - Sample broken in transit

*Although some water quality parameters were measured at this sample point (see pg. G-9), its proximity to sample point 0159-NS-002 dictated that organic analyses should only be run at one of the two points. Thus results from 0159-NS-002 were considered representative of both sampling locations, and sampling at 0159-NS-001 was discontinued.

Table IV-7. ANALYTICAL DATA FOR SAMPLES COLLECTED BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

	Concentration (μg/l)	
Pollutant	Site A	Site B
Benzene	<1.0	<1.0
Toluene	1.2	3.2
Xylenes	<1.0	<1.0
Total Hydrocarbons	3.0	5.6

Note: All samples collected 8-24-84.

Site A: Holding pond at the confluence of surface drainage streams at the base golf course.

Site B: End of pier at Cliff Haven beach where base golf course surface drainage channels flow into Lake Champlain.

in and the fuel was pumped into them. Approximately 8,500 gallons of fuel were recovered. Some fuel, estimated to be 10-15 gallons, escaped and percolated into the sandy grassy area surrounding the pit.

Since evidence of environmental contamination is confirmed for this site, Site SP-5 was rated using HARM. The HARM score for this site is 50.

f. Site SP-6, JP-4 Spills at AF Vehicle Maintenance Area

Maintenance for base fuel tanker trucks is carried out in Building 2542 located in the motor pool yard. Base personnel described JP-4 fuel spills on the pavement outside Building 2542. Trucks brought in for scheduled maintenance would have residual fuel drained from their tanks. Details of such spills were not available.

Total quantities of fuel dumped or spilled in this area were not determinable. It was estimated that 25-50 gallons of fuel were dumped per truck serviced. Any spilled material would have drained to a grassy area behind and between the shop and the railroad tracks. Drainage maps of the installation indicated that surface runoff of stormwater may have occurred from this grassy area resulting in contaminant migration.

Since evidence of spills and potential environmental contamination were uncovered during data review and in interviews, Site SP-6 was rated using HARM. The HARM score for this site is 56.

g. Site SP-7, Number 2 Fuel Oil Spill Behind DPDO Office

A heating oil spill was detected behind the DPDO office (Building 1810) in 1983. An estimated 25 to 50 gallons of fuel leaked from the source onto the asphalt drainage ditch around the office where it was contained. An unknown quantity was absorbed by the sandy soil around the tank.

The leak occurred when work was being done in the tank vicinity and the underground fuel tank was punctured. Subsequently, rainwater drained into the tank causing the fuel oil to rise and eventually flow out of the hole. The tank and some soil around it were excavated and a new underground tank was placed at an adjacent site. No visible evidence of contamination was noticed during site inspection.

Since information regarding a leak and spill was uncovered from base personnel interviews that suggests potential for environmental contamination, this site was rated using HARM. The HARM score for Site SP-7 is 50.

h. Site SP-8, Fuel Spills in POL Storage Area

Fuel spills in the POL storage yard have resulted primarily from loading and off-loading tanker trucks. Spills have either drained into the ground along the concrete loading area or drained to a grassy sloped embankment between the loading platform and the dikes surrounding the three above ground storage tanks. Runoff from the embankment flows to a drainage ditch that discharges to Lake Champlain off-base. Flow to this drainage ditch also comes from stormwater collected inside the three diked storage tank sites. Drainage sewers from the dikes were routinely closed to contain potential spills. Valves were opened only to allow stormwater to drain when necessary and then reclosed.

Site inspection of the POL stormwater drainage ditch was made several days after a rainstorm. Oily deposits were observed on the muddy bottoms and sides of the ditch and on the surface of the small flow being discharged from the POL yard collector sewer pipe. A heavy hydrocarbon smell was noticeable in the drainage ditch.

One sampling site was located on this storm drainage ditch and labeled 0159-NS-008. Analytical data available on water quality in this ditch have been presented in Table IV-6. Results of sampling show the existence of oil and grease residues in this drainage ditch.

Evidence was obtained indicating environmental contamination at this site, and potential for migration of hazardous materials to a surface water body. Therefore, this site was rated using HARM. Site SP-8 received a HARM score of 77.

i. Site SP-9, Solvent Spills in MMS Industrial Complex

The MMS industrial complex is located north of the WSA bunkers. Solvents, paints and thinners, and POL products in this area are used in conjunction with routine maintenance, repair, and cleaning of munitions and munitions support equipment. The MMS area is drained by a system of surface channels or ditches that flow south past the WSA and discharge to the Salmon River. These ditches comprise the storm drainage system as no underground sewer system exists at this site. Sanitary sewage is collected at a pumphouse and pumped to a leach field. Therefore, spills occurring in the MMS industrial area which are not contained and cleaned up make their way to the surface ditches. Reportedly, oil sheens on the water in the drainage streams have been observed.

The Bioenvironmental Engineering office has operated a water monitoring location (0159-NS-004) just upstream of the drainage discharge to the Salmon River. Water quality data from sample analysis has been presented in Table IV-6. Organic contaminants including methylene chloride, benzene, toluene, DCE, TCE, and 1,1,1-trichloroethane have been detected in the micrograms per liter range. These are suspected of originating in the industrial section of WSA/MMS as a result of spills.

Since evidence of surface water contamination by hazardous materials is documented, this site was rated using HARM. The HARM score for this site is 70.

j. Site SP-10, JP-4 Spills at Alert Flightline Ramp

Fuel spills in the alert ramp area have occurred. This area, however, was segregated as a separate site because stormwater drainage for this site is routed north to the Saranac River instead of south to the golf course drainage streams. Large spills occurring on the alert ramp have been contained and recovered if possible. Absorbent pads have also been used with residual fuel being washed to the storm drains. Small spills have been routinely washed down. Containment of large spills has been effected by closing a gate valve in the drainage conduit. This valve is located several feet outside the alert area fenceline in the northeast corner of the ramp. As spills drained into the sewer lines they were pumped out into holding tanks or bowsers. When washdown was completed and all liquid pumped from the sewers, the valve was reopened.

Base personnel indicated that significant fuel spills had occurred in this area and that procedures for closing the valve and pumping the sewer lines were followed. No oil absorbent booms or oil/water separator were installed on the drainage conduit and, because the gate valve leaked, material that escaped through the gate valve or small spills washed down with water were discharged directly to the river.

Site SP-1C was rated using HARM because evidence obtained through data review and interviews indicated a potential for environmental contamination and migration from this site. The HARM score for Site SP-10 was 68.

k. Site SP-11, Engine Oil Spills in New Base Housing Area

In October 1984 the storm sewer draining sections of new base housing became clogged by leaves and debris in a grating at the outfall. The outfall is located at the southwest corner of the old base adjacent to the Ultramar Oil Company storage tanks. When maintenance workers went to clean

out the sewer they found a petroleum residue on the water and around the outfall. Samples of the material were analyzed by the bioenvironmental engineer and results indicated the material was not JP-4 fuel or fuel oil.

The base concluded that the petroleum residue was engine oil which had been dumped into storm drains by backyard mechanics during the fall. Rainstorms then washed the oil to the outfall. Based on observations made when the problem was discovered, 25 gallons of engine oil were estimated dumped. This does not include material that may been washed out prior to the backup.

This site was rated using HARM because of evidence indicating environmental contamination. The HARM score for Site SP-11 was 51.

l. Site SP-12, New Product Drum Storage Northwest of Building 2890

New product drum storage on the northwest end of Building 2890 comprises 55-gallon drums of MEK solvent used in FMS corrosion control activities. Typically, three to four drums of MEK solvent are stored on a rack adjacent to an asphalt parking lot.

Evidence of an oil or solvent spill was noticeable on the ground as the sandy soil in the storage area was blackened. The contaminated area covered a circular area with approximately a 10 foot diameter.

Because of visible evidence of contamination, this site was rated using HARM. Site SP-12 received a HARM score of 52.

m. Site SP-13, Spent and New Product Drum Accumulation Outside Building 2774

Drums of waste and new product including carbon remover solvent, PD680 cleaning solvent, engine oil and hydraulic fluid are accumulated on a concrete slab outside the southeast corner of Building 2774. Waste drums are filled using funnels, and new product is obtained from drums fitted with spigots and stored on racks. As many as 15 to 20 drums may be stored in this area at one time.

Information obtained from base personnel interviews disclosed that accidental spills have occurred in this accumulation area from buckets of new or waste material. Spillage resulting from filling waste drums was also noted. Presently there is no containment of spilled material and environmental contamination is possible from runoff of these spills.

Since evidence of environmental contamination was uncovered during the data review and interview process, Site SP-13 was rated using HARM. This site received a HARM score of 48.

5. Wastewater Disposal

Most of Plattsburgh AFB is serviced by sanitary sewers which are connected to the City of Plattsburgh Treatment Plant. Remote areas of the base that require sanitary sewage disposal are equipped with septic tanks. There are eight septic tank systems on the base.

No evidence of potential for environmental contamination was uncovered for any of these sites. Therefore, none of these sites was rated using HARM.

V. CONCLUSIONS

The goal of the IRP Phase I Records Search is to identify sites where there is the potential for environmental contamination resulting from past waste disposal practices and to assess the probability of contaminant migration from these sites. The conclusions given below are based on the assessment of information collected from the project team's field inspection, review of records and files, review of the environmental setting, and interviews with base personnel, past employees, and state and local government officials. A listing of all interviewees and outside agency contacts is provided in Appendix B.

Table V-1 is a ranking of the 13 potential contamination sites identified at Plattsburgh AFB by their final HARM scores. HARM subscores for those sites are also provided. The meteorology, geology and population characteristics for several of the sites are very similar, so some effort was made to emphasize the differences among the sites. The locations of each of the sites are shown in Figure V-1. The HARM rating forms for each site are presented in Appendix D.

A. Site Specific Conclusions

1. Site SP-3, JP-4 and solvent spills, SAC Flightline, Ramp and Adjacent Industrial Area

This site received a HARM score of 79. The waste characteristics subscore was 100. This high subscore was due to a large waste quantity factor and a high hazard rating factor. Although only small quantities have been discharged on a daily basis, this becomes a large quantity over the history of the installation. The high score for ignitability for benzene (found in fuels) and the high scores for toxicity and persistence of solvents also gave high waste characteristics ratings. The potential pathways were not rated for this site because analytical data from surface water sampling of site runoff

TABLE V-1. SUMMARY OF HARM SCORES FOR THE RATED SITES, PLATTSBURGH AFB, NEW YORK

Number	Site Description	Rank	Receptors Subscore	Waste Characteristics Subscore	Pathways Subscore	Gross Total Score	Final Score
SP-3	JP-4 and solvent spills, SAC Flight-line, Ramp and Adjacent Industrial Area	1	49	100	100	83	79
SP-8	Fuel spills, POL Storage Area	2	53	90	100	81	77
SP-9	Solvent spills, MMS Industrial Complex	3	54	54	100	70	70
SP-10	JP-4 spills, Alert Area	4	46	90	80	72	68
FT-1	Fire Training Area	5	54	90	63	69	66
D-4	Landfill, south of Fire Training Area	6	54	40	93	62	62
SP-6	JP-4 spills, AF Vehicle Maintenance Building 2542	7	46	63	58	56	56
SP-2	Number 2 heating fuel spill, Building 205	8	44	54	65	54	54
SP-12	New Product Drum Storage Area, outside NW corner of Building 2890	9	46	48	61	52	52

TABLE V-1. SUMMARY OF HARM SCORES FOR THE RATED SITES, PLATTSBURGH AFB, NEW YORK (Continued)

Number	Site Description	Rank	Receptors Subscore	Waste Characteristics Subscore	Pathways Subscore	Gross Total Score	Final Score
SP-11	Engine oil spills, New Base Housing Area	10	49	24	80	51	51
SP-7	Number 2 fuel oil spill, behind DPDO Office	11	45	54	58	52	50
SP-5	JP-4 spill, Isolation Valve Pit SE of Flightline Ramp	12	49	54	54	52	50
SP-13	New and Spent Product Drum Accumulation Area, outside SE corner of Building 2774	13	46	40	58	48	48

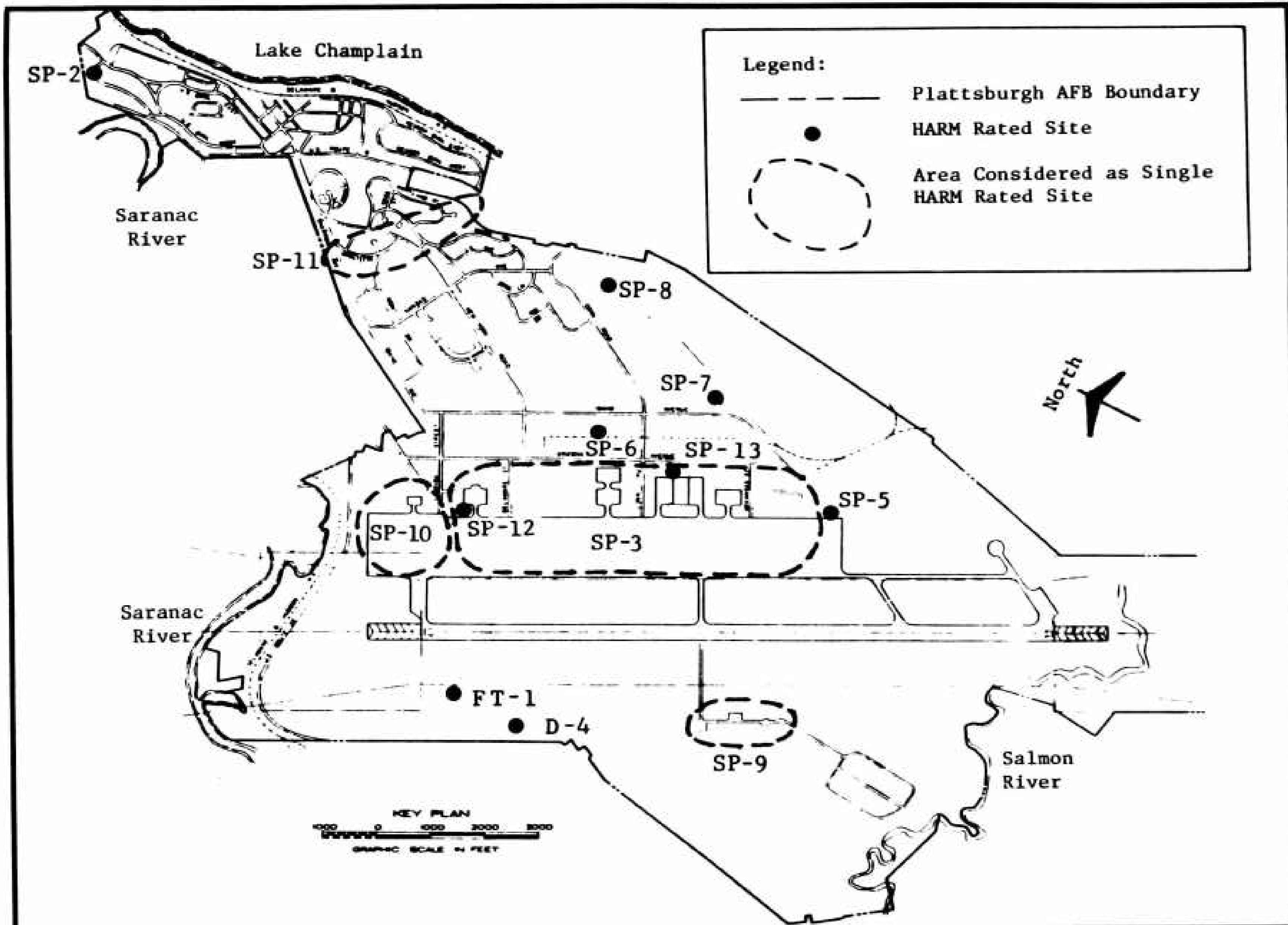


Figure V-1. Locations of HARM Rated Sites, Plattsburgh AFB, New York

provided direct evidence for migration of hazardous contaminants. The gross total score for this site was reduced by five percent due to the placement of oil-absorbent booms on the drainage channel.

2. Site SP-8, Fuel Spills, POL Storage Area

This site received a HARM score of 77. The waste characteristics factors were similar to Site SP-3 except that a lower persistence factor was applied since no solvents are present in the discharge. The potential pathways were not rated for this site because analytical data from surface water sampling of site runoff provided direct evidence for migration of hazardous contaminants. The gross total score for this site was reduced by five percent due to the placement of oil-absorbent booms on the drainage channel.

3. SP-9, Solvent Spills, MMS Industrial Complex

This site received a HARM score of 70. A small waste quantity was assigned to the site since the area has a relatively small solvent usage. A persistence factor of 0.9 was applied since MEK is the only solvent used. The potential pathways were not rated for this site because analytical data from surface water sampling of site runoff provided direct evidence for migration of hazardous contaminants. The gross total score for this site was not reduced because no waste management practices were in-place.

4. Site SP-10, JP-4 Spills, Alert Area

This site received a HARM score of 68. The waste characteristics subscore was the same as Site SP-8, discussed above. For the pathways subscore a value of 80 was assigned for indirect evidence of migration of hazardous contaminants. Although there are no analytical data from surface water sampling of site runoff, activities at the Alert Area were likely to generate contaminants that would have been washed into the storm drain at the site. A pathways subscore was also determined by rating the migration potential for

surface water, flooding, and ground water. The score for migration potential for surface water was the highest of the three but was not higher than the score assigned for indirect evidence. The gross total score for this site was reduced by five percent because there is a gate valve on the drainage pipe which is closed when a spill occurs and is not reopened until the spilled material is pumped out.

5. Site FT-1, Fire Training Area

This site received a HARM score of 66. The site received a high waste characteristics subscore because a large waste quantity factor and a high hazard rating factor was applied. Although relatively small quantities of fuel may be lost (30-40 gallons) per day of fire training, this becomes a large quantity over the history of the installation. The high score for ignitability for benzene (found in fuels) gave the high hazard rating factor. The potential pathways for migration of hazardous contaminants for surface water, flooding and ground water were evaluated for this site. The surface water pathway received the highest subscore because of high net precipitation and low surface permeability. The gross total score for this site was reduced by five percent because one of the pits at the site has been deactivated and the other two pits were lined with bentonite in 1980.

6. Site D-4, Landfill, south of Fire Training Area

The site received a HARM score of 62. The waste characteristics subscore was low because only unconfirmed information indicated that small quantities of hazardous wastes were ever disposed in the landfill. The potential pathways for migration of hazardous contaminants for surface water, flooding, and ground water were evaluated for this site. The ground-water pathway received the highest subscore because of the shallow depth to the ground water, high net precipitation, high soil permeability, and direct access to the ground water at the site. The gross total score for this site was not reduced because no waste management practices were in-place.

7. Site SP-6, JP-4 Spills, AF Vehicle Maintenance Building 2542

The site received a HARM score of 56. The waste characteristics subscore was 63. It was estimated that only a small quantity of waste was spilled at this site and that information was not confirmed. The potential pathways for migration of hazardous contaminants for surface water, flooding, and ground water were evaluated for this site. The ground-water pathway received the highest subscore because of the shallow depth to ground water, high net precipitation, and high soil permeability. The gross total score for this site was not reduced because no waste management practices were in-place.

8. Site SP-2, Number 2 heating fuel spill, Building 205

This site received a HARM score of 54. The waste characteristics subscore is low because only a small quantity of fuel was spilled. The potential pathways for migration of hazardous contaminants for surface water, flooding, and ground water were evaluated for this site. The ground-water pathway received the highest subscore because of the shallow depth to ground water, high net precipitation, and high soil permeability. The gross total score for this site was not reduced because no waste management practices were in-place.

9. Site SP-12, New Product Drum Storage Area, outside NW corner of Building 2890

The site received a HARM score of 52. The waste characteristics subscore was low because only a small quantity of MEK was spilled at the site. The potential pathways for migration of hazardous contaminants for surface water, flooding, and ground water were evaluated for this site. The surface water pathway received the highest subscore because of the proximity of the site to surface water and high net precipitation. The total gross score for this site was not reduced because no waste management practices were in-place.

10. Site SP-11, Engine oil spills, New Base Housing Area

The site received a HARM score of 51. The waste characteristics subscore was low because only a small quantity of a low hazard waste was spilled. For the pathways subscore a value of 80 was assigned for indirect evidence of migration of hazardous contaminants. Analytical data are available which confirm the migration of contaminants but they do not confirm this site as the source. A pathways subscore was also determined by rating the migration potential for surface water, flooding, and ground water. The score for migration potential for surface water was the highest of the three but was not higher than the score assigned for indirect evidence. The gross total score for this site was not reduced because no waste management practices were in-place.

11. Site SP-7, Number 2 fuel oil spill, behind DPDO Office

This site received a HARM score of 50. The waste characteristics subscore was low because only a small quantity of fuel was spilled. The potential pathways for migration of hazardous contaminants for surface water, flooding, and ground water were evaluated for this site. The ground-water pathway received the highest subscore because of the shallow depth to ground water, high net precipitation and high soil permeability. The gross total score for this site was reduced by five percent because some of the contaminated soil was removed shortly after the spill occurred.

12. Site SP-5, JP-4 Spill, Isolation Valve Pit SE of Flightline Ramp

This site received a HARM score of 50. The waste characteristics subscore was low because only a small quantity of fuel escaped from the concrete pit and was not recovered. The potential pathways for migration of hazardous contaminants for surface water, flooding, and ground water were evaluated for this site. The surface water pathway received the highest subscore because of the proximity of the site to surface water and high net

precipitation. The total gross score for this site was reduced by five percent because the major quantity of the spill was contained in the pit and recovered.

13. Site SP-13, New and Spent Product Drum Accumulation Area, outside SE corner of Building 2774

This site received a HARM score of 48. The waste characteristics subscore was low because only a small quantity was reported to have been spilled and the report was unconfirmed. The potential pathways for migration of hazardous contaminants for surface water, flooding, and ground water were evaluated for this site. The ground-water pathway received the highest subscore because of the shallow depth to ground water, high net precipitation and high soil permeability. The gross total score for this site was not reduced because no waste management practices were in-place.

VI. RECOMMENDATIONS

The final HARM scores for each of the 13 rated sites (a total of 22 sites were screened) were compared and a relative scale of potential risk was developed which is presented in Table VI-1. Of greatest concern are the six high risk sites. Recommendations for Phase II activities at these sites are described below. Two sites received a moderate potential risk rating. Limited Phase II activities at these sites are also described below. The remaining five rated sites are considered to pose a low potential risk. On the basis of data currently available, no further actions are recommended.

Although the remaining nine nonrated sites were determined not to require further study at the present time, they still represent potential environmental concerns. They should be evaluated for environmental impact prior to any activities which might cause disruption.

A. Recommended Phase II Activities

Since only limited surface water sampling data are currently available, collection and analysis of surface water, pond sediment, ground water and soil boring samples is recommended. The rationale for recommending each type of sampling effort is discussed below.

Surface water is the most evident pathway for contaminant migration off-base from surficial sources. Surface water sampling is also the simplest type of sampling effort to undertake. A long-term data base of analytical data characterizing constituents in the surface water discharged from the installation is valuable. Such information will allow assessment of seasonal variation of contaminants and aid in determining the sources of the contaminants. For two sites, recommended surface water samples are located adjacent to or at the discharge point of areas suspected of causing contamination. For one of these sites, samples upstream and downstream of the area have also been recommended in an attempt to verify the source of contamination.

TABLE VI-1. POTENTIAL RISK RANKING BASED ON FINAL HARM SCORES

Site Number	Description	Final HARM Score	Potential Risk
SP-3	JP-4 and solvent spills, SAC Flightline, Ramp and Adjacent Industrial Area	79	High
SP-8	Fuel spills, POL Storage Area	77	
SP-9	Solvent spills, MMS Industrial Complex	70	
SP-10	JP-4 spills, Alert Area	68	
FT-1	Fire Training Area	66	
D-4	Landfill, south of Fire Training Area	62	
SP-6	JP-4 spills, AF Vehicle Maintenance Building 2542	56	Moderate
SP-2	Number 2 heating fuel spill, Building 205	54	
SP-12	New Product Drum Storage Area, outside NW corner of Building 2890	52	Low
SP-11	Engine oil spills, New Base Housing Area	51	
SP-7	Number 2 fuel oil spill, behind DPDO Office	50	
SP-5	JP-4 spill, Isolation Valve Pit SE of Flightline Ramp	50	
SP-13	New and Spent Product Drum Accumulation Area, outside SE corner of Building 2774	48	

Pond sediment samples are recommended to determine the extent of the contamination in the holding ponds themselves. Since the ponds may have held contaminated runoff water over many years of base operations, it is possible that the sediments may be contaminated and may require some remedial action.

Ground water samples are recommended because of the sensitive nature of aquifers: they may be easily contaminated but are difficult to clean up and residual contamination may affect the use of an aquifer for decades. Recommendations for locations of wells generally include one well upgradient of the site and multiple wells in the expected direction of ground-water flow. Well depths specified are predominantly shallow to characterize the quality of the upper-most part of the aquifer nearest the suspected sources of contamination. However, a deep well was recommended adjacent to a shallow well at two sites to compare the characteristics of deep and shallow ground water and determine if selective contamination of the shallow or deep ground water exists.

Soil borings are recommended to assess the extent of soil contamination in areas where spills have occurred. Soil contamination indicates that ground-water contamination resulting from a spill is more likely to have occurred. Soil borings are also recommended adjacent to three drainage streams on base. These borings, coupled with information from wells at the sites, are intended to determine if surface water contaminants present during low-flow periods are discharged to the stream in the ground water or are absorbed into the soil during high-flow periods and are then leached out during low-flow periods. Additionally, soil borings can provide a comparison of contaminant levels at various depths throughout the soil column.

The locations of recommended sampling points and a description of their locations are presented in Figure VI-1 and Table VI-2, respectively. Specific recommendations for each site are discussed below. Recommendations for pollutants to be analyzed are presented at the end of this section.

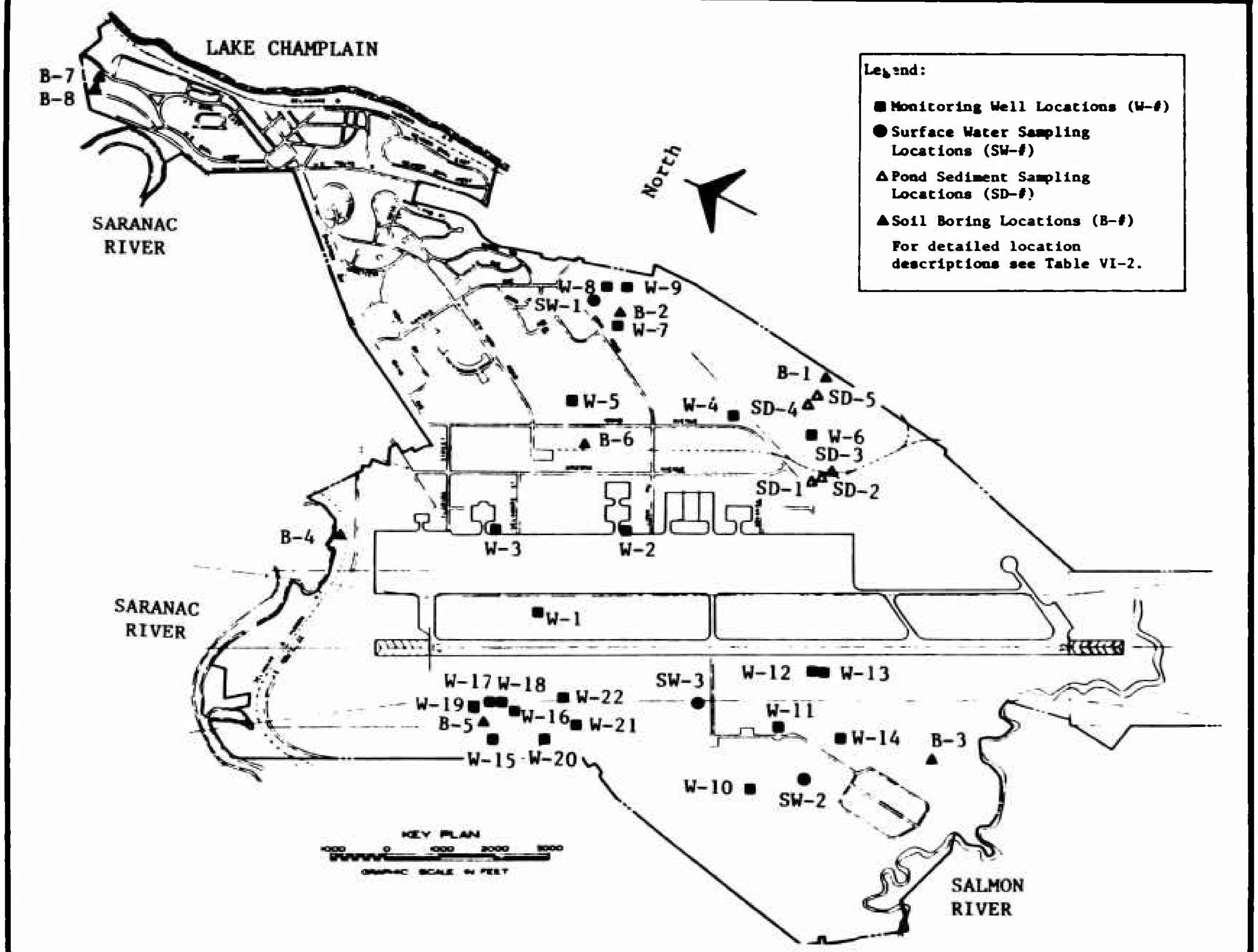


Figure VI-1. Recommended Sample Collection Locations at Plattsburgh AFB, New York

TABLE VI-2. RECOMMENDED SAMPLING LOCATIONS AT PLATTSBURGH AFB, NEW YORK

SURFACE WATER SAMPLING LOCATIONS

Sample Point Number	Site Number	Sample Location
SW-1	SP-8	Culvert approximately 300 feet north of POL Storage Area gate
SW-2	SP-9	Culvert near WSA fenceline approximately 500 feet west of Building 3568
SW-3	SP-9	Culvert approximately 150 feet east of Building 3592

GROUND WATER SAMPLING LOCATIONS

Monitoring Well Number	Site Number	Monitoring Well Location	Monitoring Well Depth (feet)
W-1	SP-3	Approximately 300 feet west of JP-4 Pumphouse 3280	15
W-2	SP-3	Snow storage area west of Building 2797	15
W-3	SP-3	Snow storage area west of Building 2841	15
W-4	SP-3	Approximately 500 feet north of DPDO	15
W-5	SP-3	Approximately 200 feet east of Building 1870	15
W-6	SP-3	North side of Golf Course Fairway 2	15
W-7	SP-8	Approximately 300 feet west of Storage Tank 2075	10
W-8	SP-8	Approximately 400 feet east of POL Storage Area gate	10
W-9	SP-8	Approximately 800 feet east of Storage Tank 2077	10

TABLE VI-2. RECOMMENDED SAMPLING LOCATIONS AT PLATTSBURGH AFB, NEW YORK (Continued)

Monitoring Well Number	Site Number	Monitoring Well Location	Monitoring Well Depth (feet)
W-10	SP-9	Approximately 1,000 feet west of Building 3578	20
W-11	SP-9	Approximately 50 feet east of Building 3569	30
W-12	SP-9	Approximately 1,000 feet southeast of Building 3569	50
W-13	SP-9	Approximately 1,000 feet southeast of Building 3569	130
W-14	SP-9	Approximately 700 feet south of Building 3568	20
W-15	FT-1	Approximately 100 feet west from the edge of the westernmost active pit	40
W-16	FT-1	Approximately 100 feet southeast from the edge of the easternmost active pit	40
W-17	FT-1	Approximately 100 feet east from the edge of the easternmost active pit	40
W-18	FT-1	Approximately 100 feet east from the edge of the easternmost active pit	125
W-19	FT-1	Approximately 200 feet northeast from the edge of the easternmost active pit	40
W-20	D-4	Approximately 400 feet west from the center of the landfill	40
W-21	D-4	Approximately 900 feet southeast from the center of the landfill	40
W-22	D-4	Approximately 600 feet east from the center of the landfill	40

TABLE VI-2. RECOMMENDED SAMPLING LOCATIONS AT PLATTSBURGH AFB, NEW YORK (Continued)

SOIL BORING LOCATIONS

Soil Boring Number	Site Number	Soil Boring Location	Soil Boring Depth (feet)	Sampling Interval (feet)
B-1	SP-3	Near the culvert approximately 600 feet downstream from the second holding pond in series of two ponds which drain the industrial area, approximately 2 feet from the edge of the drainage ditch on the north bank	10	2
B-2	SP-8	Between JP-4 fill station and the railroad tracks	10	2
B-3	SP-9	Approximately 1,200 feet upstream from the WSA drainage outfall to the Salmon River, approximately 2 feet from the edge of the water in the drainage ditch on the east bank	5	1
B-4	SP-10	Near the culvert at the Alert Area Drainage outfall, approximately 10 feet towards the Saranac River from the outfall	10	2
B-5	FT-1	Inside inactive pit	40	5
B-6	SP-6	Approximately 75 feet southwest from the southwest corner of Building 2542	9	1.5
B-7	SP-2	Area where leak occurred	9	1.5
B-8	SP-2	Tile field area which drains to storm sewer	9	1.5

TABLE VI-2. RECOMMENDED SAMPLING LOCATIONS AT PLATTSBURGH AFB, NEW YORK (Continued)

POND SEDIMENT SAMPLING LOCATIONS

Sediment Sample Number	Site Number	Sediment Sample Location
SD-1	SP-3	First holding pond in series of three ponds which drain the flightline and part of the industrial area
SD-2	SP-3	Second holding pond in series of three ponds which drain the flightline and part of the industrial area
SD-3	SP-3	Third holding pond in series of three ponds which drain the flightline and part of the industrial area
SD-4	SP-3	First holding pond in series of two ponds which drain the industrial area
SD-5	SP-3	Second holding pond in series of two ponds which drain the industrial area

1. Recommended Activities at High Potential Risk Sites

There are six sites at Plattsburgh AFB which received a high potential risk rating when the HARM model was applied. At three of the sites, surface water, ground water and soil boring sample collection is recommended. Only surface water and soil boring samples are recommended at a fourth site and only ground water and soil boring samples are recommended at the fifth site.

a. Site SP-3 and Site SP-10

Site SP-3 received the highest rating (79). This site includes the drainage area from the flightline area (except for the Alert Area) and includes the Instrument Runway, Parking Ramp, and all of the adjacent industrial areas (maintenance hangars, etc.). This area drains to the Golf Course drainage system and into Lake Champlain. Site SP-10 received the fourth highest rating (68). This site includes the drainage from the Alert Area and drains to the Saranac River which empties into Lake Champlain.

Since the two sites are adjacent to each other and similar types and quantities of contaminants would be expected in both sites, it is useful to take an "integrated" approach to data collection in these areas. Thus, the two sites will be considered as a single area for Phase II recommendations.

It is recommended that five pond sediment samples be collected and analyzed. One should be collected from each of the drainage holding ponds. The pond locations are shown on Figure III-6.

It is recommended that six ground-water monitoring wells be placed in a grid pattern in the Site SP-3 area. No wells are recommended for the Alert Area. One of the wells is to be located upgradient (west) of the area, two are to be located in the snow storage areas adjacent to the ramp, and three others are to be located downgradient of the area. This pattern should

be sufficient to determine the presence and/or migration of contaminants at this site. All six of the wells should be relatively shallow (approximately 15 feet).

In addition, it is recommended that two soil boring samples be collected in the area, one at the Golf Course drainage area discharge and one at the Alert Area drainage discharge. These soil borings should be approximately 10 feet deep with samples collected at two foot intervals.

b. Site SP-8

Site SP-8 received the second highest rating (77). This site includes the drainage area from the POL storage yard and drains into Lake Champlain.

It is recommended that one surface water sampling location be established, at the effluent from the POL storage yard. Characterization of the types of petroleum products in the stream may provide evidence for the ultimate source of the contaminants.

It is also recommended that three ground-water monitoring wells be placed at the site. One is to be placed upgradient of the POL storage yard and two are to be placed downgradient. This pattern should be sufficient to determine the presence and/or migration of contaminants at this site. The three wells should be relatively shallow (approximately 10 feet).

In addition, it is recommended that one soil boring sample be collected inside the POL storage yard near the JP-4 fill station area. The boring should be approximately 10 feet deep with samples collected at two foot intervals.

c. Site SP-9

Site SP-9 received the third highest rating (70). The site includes the drainage area from the WSA and MMS industrial area. The site drains into the Salmon River which discharges to Lake Champlain.

It is recommended that two surface water sampling locations be established. These should be at the influent and effluent to the MMS industrial area.

It is also recommended that five ground-water monitoring wells be placed at the site. One is to be placed upgradient of the MMS industrial area, one is to be placed at the MMS industrial area, and four are to be placed at expected downgradient locations. This pattern should be sufficient to determine the presence and/or migration of contaminants at this site. Four of the wells should be relatively shallow (approximately 20-50 feet) and one of the downgradient wells should be adjacent to a shallow well and be relatively deep (approximately 130 feet).

In addition, it is recommended that one soil boring sample be collected along the drainage ditch just past the WSA. The boring should be approximately five feet deep with samples collected at one foot intervals.

d. Site FT-1

Site FT-1 received the fifth highest rating (66). This site includes the two active fire training pits and one inactive pit. The two active pits are currently lined with bentonite clay, the inactive pit has never been lined. During the on-site visit it was reported that the pit liners are believed to be leaking.

It is recommended that five ground-water monitoring wells be placed at the site. One is to be placed upgradient of the site and four are to be

placed downgradient. This pattern should be sufficient to determine the presence and/or migration of contaminants at this site. Four of the wells should be relatively shallow (approximately 40 feet) and one of the downgradient wells should be adjacent to a shallow well and be relatively deep (approximately 125 feet).

It is also recommended that one soil boring sample be collected from inside the unlined, inactive pit. The boring should be approximately 40 feet deep with samples collected at five foot intervals.

e. Site D-4

Site D-4 received the sixth highest rating (62). This site was the last active landfill operated on the base. It is located south of and adjacent to the fire training area, approximately 1,500 feet from the instrument runway.

It is recommended that three ground-water monitoring wells be placed at the site. One is to be placed upgradient of the site and two are to be placed at expected downgradient locations. This pattern should be sufficient to determine the presence and/or migration of contaminants at this site. The three wells should be relatively shallow (approximately 40 feet).

2. Recommended Activities at Moderate Potential Risk Sites

There are two sites at Plattsburgh AFB which received a moderate potential risk rating when the HARM model was applied. A limited Phase II sample collection and analysis program (soil borings only) is being recommended for these sites.

a. Site SP-6

Site SP-6 received a rating of 56. This site is the AF vehicle maintenance building where JP-4 fuel spills are likely to have occurred as a result of maintenance of POL trucks.

It is recommended that one soil boring sample be collected in the area where the spills may have occurred. The boring should be approximately nine feet deep with samples collected at 1.5 foot intervals.

b. Site SP-2

Site SP-2 received a rating of 54. This site is the location of a base housing heating oil spill from an underground tank leak. In the immediate vicinity of the site is a tile field which drains ground water to a storm drain to prevent basement flooding.

It is recommended that two soil boring samples be collected, one in the area where the spill occurred and the other near the drainage tile field. The borings should be approximately nine feet deep with samples collected at 1.5 foot intervals.

B. Additional Phase II Activities

The Phase II sample collection program described above should provide adequate data to determine the presence and/or migration of contaminants from the eight sites. However, it is possible that inconclusive results may be obtained or the extent of migration from a particular site may not be fully defined. If this occurs, additional Phase II testing may be required. In order to minimize the number of permanent wells required for such sampling, soil vapor monitoring techniques would be recommended. Surface spills and underground leaks of hydrocarbon liquids result in soil contamination by liquid and vapor. Just as a spilled hydrocarbon liquid can result in an

expanding zone of contamination, vapors from the spill can migrate through the ground to the land suface. Like the liquid, the vapors migration rate depends on a number of variables including volume of liquid released, depth to ground water, soil characteristics, and conduits for transport. Soil vapor monitoring techniques, measuring fugitive gas emissions, along with a minimum number of soil borings and observation wells can be used to characterize a spill plume. The direct emissions measurement techniques have been successfully used to assess soil hydrocarbon vapor contamination from leaking storage tanks, pipelines, ponds, surface spills, and from hydrocarbon liquid on ground water to depths of approximately 90 feet. The principal advantage of soil vapor monitoring is the ease in which samples can be obtained. Since the ground probes are portable, they are easily inserted and removed from the ground, generally without the use of an auger. After sampling, holes left by the probe can be immediately back-filled.

C. Recommended Pollutants for Analysis

At each of the eight sites, the same types of contaminants are likely to be present. These include industrial solvents and fuel types, including JP-4, heating oil, and AVGAS, which was used commonly at Air Force Installations in the 1950s and 1960s. The major components of all of these contaminants fall into one of two types of compounds: volatile organics and semi-volatile organics. For this reason it is recommended that all surface water, pond sediment, ground water and soil boring samples be analyzed for these two classes of compounds. In addition, the surface water and ground water samples should be analyzed for oil and grease and total organic carbon (TOC).

All of the organic analysis should be done in accordance with the specifications of EPA SW-846 (U.S. EPA, 1982). Method 8240, including the purge and trap, should be performed for the volatile organics. A list of pollutant parameters detected and quantified by this method is presented in Table VI-3.

Method 8270 should be performed for the semi-volatile organics. Only the base/neutral semi-volatile organics would be present in solvents and fuel types, so an analysis for acid extractable semi-volatile organics would not be required. Method 8270 requires specific sample preparation steps prior to analysis. For the surface water and ground water samples a separatory funnel extraction (Method 3510) or a continuous extraction (Method 3520) can be performed. For the pond sediment and soil boring samples a soxhlet extraction (Method 3540) or a sonication (Method 3550) can be performed. A list of pollutant parameters detected and quantified by this method is presented in Table VI-4.

The oil and grease analysis on the aqueous samples should be performed in accordance with the specifications of EPA Method 413.2 (U.S. EPA, 1979). The TOC analysis should be performed in accordance with the specifications of EPA SW-846 Method 9060 (U.S. EPA, 1982).

TABLE VI-3. LIST OF VOLATILE ORGANICS DETECTED USING EPA SW-846 METHOD 8240

Benzene
Bromodichloromethane
Bromoform
Bromomethane
Carbon tetrachloride
Chlorobenzene
Chloroethane
2-Chloroethyl vinyl ether
Chloroform
Chloromethane
Dibromochloromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethyl benzene
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethene
Toluene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane
Vinyl chloride

Source: U.S. Environmental Protection Agency, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", SW-846, 2nd Edition, 1982.

TABLE VI-4. LIST OF BASE/NEUTRAL SEMI-VOLATILE ORGANICS DETECTED USING EPA SW-846 METHOD 8270

1,3-Dichlorobenzene	Phenanthrene	Indeno(1,2,3-c,d)pyrene
1,4-Dichlorobenzene	Anthracene	Dibenzo(a,h)anthracene
Hexachloroethane	β-BHC	Benzo(ghi)perylene
Bis(2-chloroethyl) ether	Heptachlor	N-Nitrosodimethyl amine
1,2-Dichlorobenzene	δ-BHC	Chlordane
Bis(2-chloroisopropyl) ether	Aldrin	Toxaphene
N-Nitrosodi-n-propyl amine	Dibutyl phthalate	PCB 1016
Nitrobenzene	Heptachlor epoxide	PCB 1221
Hexachlorobutadiene	Endosulfan I	PCB 1232
1,2,4-Trichlorobenzene	Fluoranthene	PCB 1242
Isophorone	Dieldrin	PCB 1248
Naphthalene	4,4'-DDE	PCB 1254
Bis(2-chloroethoxy) methane	Pyrene	PCB 1260
Hexachlorocyclopentadiene	Endrin	
2-Chloronaphthalene	Endosulfan II	
Acenaphthylene	4,4'-DDD	
Acenaphthene	Benzidine	
Dimethyl phthalate	4,4'-DDT	
2,6-Dinitrotoluene	Endosulfan sulfate	
Fluorene	Endrin aldehyde	
4-Chlorophenyl phenyl ether	Butyl benzyl phthalate	
2,4-Dinitrotoluene	Bis(2-ethylhexyl) phthalate	
Diethylphthalate	Chrysene	
N-Nitrosodiphenylamine	Benzo(a)anthracene	
Hexachlorobenzene	3,3'-Dichlorobenzidine	
α-BHC	Di-n-octyl phthalate	
4-Bromophenyl phenyl ether	Benzo(b)fluoranthene	
γ-BHC	Benzo(k)fluoranthene	
	Benzo(a)pyrene	

Source: U.S. Environmental Protection Agency, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", SW-846, 2nd Edition, 1982.

APPENDIX A

Resumes of Key Project Personnel
for the Phase I Records Search
at Plattsburgh AFB

FRANCIS J. SMITH

EDUCATION:

M.S., Sanitary Engineering, Massachusetts Institute of Technology, 1954.

B.S., Civil Engineering, University of Michigan, 1950.

EXPERIENCE:

Program Manager, Research and Engineering Operations, Radian Corporation, McLean, Virginia, 1981-Present.

Senior Associate, Occupational Health and Safety, Environmental Engineering, A.T. Kearney Management Consultants, Alexandria, Virginia, 1980-1981.

Acting Chief Environmental Planning, Logistics and Engineering, Headquarters USAF, Washington, D.C., 1979-1980.

Chief Environmental Policy, Logistics and Engineering, Headquarters USAF, Washington, D.C., 1976-1979.

Director Environmental Protection, Air Force Systems Command (AFSC), Andrews AFB, Maryland, 1972-1976.

Chief Bioenvironmental Engineering, Headquarters Pacific Air Force, Hickam AFB, Hawaii, 1968-1972.

Similar assignments at Headquarters Alaskan Air Command, Headquarters Tactical Air Command and at Subcommands of Strategic Air Command, 1951-1968.

Junior Industrial Waste Engineer, Lederle Division, American Cyanamide, Pearl River, New York, 1950-1951.

RELEVANT EXPERIENCE:

Mr. Smith is the program manager for the Radian Basic Ordering Agreement (BOA) with the Air Force Engineering and Services Center (AFESC). It includes provision of a broad range of environmental engineering and hazardous waste management services. He is also responsible for coordinating Radian marketing to the Department of Defense. Among the areas of concern are: all aspects of the environment, occupational safety and health, hazardous wastes, analytical services and robotics.

He was the certified industrial hygienist and consultant for A.T. Kearney Management Consultants. In addition to the routine occupational safety and health activities he specialized in the interpretation of the EPA RCRA regulations. He coordinated the preparation of the proposal to EPA which brought Kearney the award of the first contract to provide RCRA technical assistance to EPA.

While at Kearney, he also participated in a health and safety evaluation of cement plants that sought to burn chemical wastes. He co-authored a feasibility study on "Assessment of Waste Fuel Use in Cement Kilns." In the same area of concern, he prepared a Draft Environmental Impact Statement (DEIS) on the burning of chemical wastes at a cement kiln. For the National Highway Safety Transportation Agency, he prepared the technical portions of a report on the testing of truck tire noise.

For three of the last four years in his assignment with Headquarters USAF, he was responsible for the air, land and water pollution abatement programs. This included programming an average of $19 million per year. Also included were: the implementation of RCRA hazardous waste management; the first USAF installation restoration program (equivalent of CERCLA-superfund); management of 17 million acres of natural resources; and the NEPA environmental impact analysis program.

In addition to these activities, he assumed responsibility for one year for the rest of Environmental Planning. This included: comprehensive base planning; the Air Installation Compatibility Use Zone (AICUZ) plans for acquiring land near bases with high noise or accident potential; and development of environmental methodologies.

At the Air Force Systems Command (AFSC), Mr. Smith organized an office to address effects of the new Federal environmental laws on the Research, Development and Acquisition programs. This office, which reported to the AFSC Chief of Staff was the highest level environmental activity ever established at a USAF major command. He directed almost all of the environmental impact statements (EIS) issued by the Air Force in this period. As part of implementation of the National Environmental Policy Act, Mr. Smith implemented a computerized system for all Research and Development projects, programs, and tasks. The program is still used. On two occasions, he was an expert witness for the Federal government. One was a suit over the health hazards associated with the siting of new type radar stations in California and Massachusetts. The other pertained to the environmental impact statement (EIS) for new facilities at Colorado Springs, Colorado.

Additionally, he was responsible for advising on the industrial hygiene and environmental needs of government owned contractor operated (GOCO) industrial plants. In this assignment and all that follow, a part of each was spent in conducting health and environment compliance inspections and audits at military installations.

During his assignment to the Pacific Air Force, Mr. Smith provided environmental and industrial hygiene guidance to USAF activities in Korea, Japan, Taiwan, Vietnam, Thailand, Philippine Islands, Guam, Trust Territories and Hawaii. This included the traditional areas of sanitary engineering (water supply, treatment and distribution; waste collection, treatment and disposal; and pest control). It also included more modern problems, such as LASER equipment calibration, maintenance and use; handling of large volumes of herbicides; noise control; industrial hygiene; and heat and cold extremes; decontamination and quarantine of equipment to prevent introduction of foreign

fauna or flora into the U.S.A. from Asia. For four years, Mr. Smith was a member of the United States delegation to the South East Asia Treaty Organization (SEATO) Military committee. He represented the U.S.A. with regard to public health engineering policies. Mr. Smith also evaluated USAF civic action programs to provide basic water and waste disposal to rural Thai villages.

The earlier USAF assignments in various commands provided environmental engineering and industrial hygiene support for the combat Air Force. Many of the previously mentioned activities were carried out as well as support for the current priority preventive medical activities. Some examples of the latter would be: defense against accidental release or delivery and use of chemical agents; improved water treatment plant operations; improved wastewater facilities and operations; conversion of dumps to sanitary fills; substitution of less toxic materials; engineering control of working exposures.

Mr. Smith worked for American Cyanamide on improving the industrial wastewater treatment of the flows from penicillin production.

CERTIFICATIONS/REGISTRATIONS AND PROFESSIONAL SOCIETIES:

Certified Industrial Hygienist by the American Board of Industrial Hygiene, 1971, No. 690.

Certified Safety Professional by the Board of Certified Safety Professionals of the Americas, 1972, No. 2103.

Registered Professional Engineer, State of Massachusetts, 1963, No. 19021.

Diplomate, American Academy of Environmental Engineers.

American Industrial Hygiene Association (National and Baltimore-Washington).

American Conference of Government Industrial Hygienists.

National (and Maryland) Society of Professional Engineers.

Federal Water Quality Association.

American Defense Preparedness Association.

Air Force Association.

MICHAEL A. ZAPKIN

EDUCATION:

M.Eng., Environmental Engineering, Rensselaer Polytechnic Institute, 1982.

M.S., Biology, Rensselaer Polytechnic Institute, 1979.

B.S., Biology, Rensselaer Polytechnic Institute, 1977.

EXPERIENCE:

Staff Environmental Engineer, Radian Corporation, McLean, Virginia, 1983-Present.

Environmental Engineer, Radian Corporation, McLean, Virginia, 1981-1983.

Research Associate, Department of Chemical Engineering and Environmental Engineering, Rensselaer Polytechnic Institute, Troy, New York, 1979-1981.

RELEVANT EXPERIENCE:

Mr. Zapkin is currently the Project Director for three USAF Record Searches which are Phase I's of the DOD Installation Restoration Program (IRP). As Project Director he is responsible for planning and coordinating all of the efforts of the Record Search Teams; schedule and budget control; and interfacing with the AFESC, MAJCOM, and installation representatives. His dual background as an environmental engineer and ecologist combined with his research on hazardous wastes from the organic chemical manufacturing industries have been of great value in this role.

Mr. Zapkin's work at Radian has primarily been in the areas of effluent guidelines development, process analysis, waste control technology analysis, and field sampling activities. Mr. Zapkin has served as Task Leader on a large multi-task contract with EPA's Effluent Guidelines Division to develop effluent limitations guidelines and standards for the nonferrous metals industry. In this capacity, he has directed efforts to propose regulations for the Nonferrous Metals Forming Point Source Category. Some of the activities under Mr. Zapkin's direction included: development of questionnaires to gather flow, production, and concentration data from industrial plants and an industry mailing list; development of an industry subcategorization scheme; engineering site visits and sampling trips at 23 industrial facilities; evaluation of end-of-pipe wastewater treatment technologies and in-process flow reduction technologies; developing compliance costs on a plant-by-plant basis; collecting, documenting, and analyzing additional technical data; preparation of a development document and rulemaking package; and numerous quick-response efforts. Prior to directing the effort for nonferrous metals forming, Mr. Zapkin served as Task Leader for the development of proposed regulations for the Aluminum Forming Point Source Category.

Mr. Zapkin has participated in a project for the Office of Solid Waste in developing engineering analysis documents for several processes in the industrial organic chemicals manufacturing industry. Waste stream sources were identified and characterized, with particular emphasis towards hazardous waste sources. Mr. Zapkin was involved with the literature search, process analysis, draft report writing, and identification of data gaps phases of the program.

On a project for the California Air Resource Board, Mr. Zapkin served as a Sampling Crew Chief for the field testing of 59 cyclic steam injected wells in a program to monitor emissions for these wells. Various sampling and analytical methods were employed to determine VOC emission factors from well vents associated with thermally enhanced oil recovery.

While at Rensselaer Polytechnic Institute, Mr. Zapkin worked on developing an adjuvant to enhance the disinfection efficiency of chlorine at high pH. He also worked on an EPA-funded project to study microbial populations at different points within a water treatment plant using activated carbon for organic removal, and along its distribution system.

PROFESSIONAL/TECHNICAL SOCIETIES:

Water Pollution Control Federation.

Virginia Water Pollution Control Association.

American Water Works Association.

Society for Industrial Microbiology.

Sigma Xi, The Scientific Research Society.

ANDREW M. OVEN

EDUCATION:

M.S., Environmental Engineering, University of California, Berkeley, 1983.

B.S., Civil Engineering, Santa Clara Univeisity, Santa Clara, California, 1982.

EXPERIENCE:

Environmental Engineer, Radian Corporation, McLean, Virginia, 1983-Present.

RELEVANT EXPERIENCE:

Mr. Oven is currently involved in supporting three Record Searches for USAF installations. They are Phase I's of the DOD Installation Restoration Program (IRP) which is concerned with the scoping and alleviation of hazardous waste site problems on military bases.

During the past year, Mr. Oven has worked on a program for EPA's Effluent Guidelines Division (EGD) to develop effluent limitations guidelines for plants in the nonferrous metals manufacturing category. This task involved compilation of information on nonferrous metal manufacturing processes from literature, analyzing industry response to questionnaires, and evaluating available sampling data from selected individual facilities for 21 subcategories. He was involved with drafting technical supplements supporting proposed effluent limitations guidelines and standards for several of these subcategories. Finally, Mr. Oven was responsible for compiling the public record in support of the nonferrous metals manufacturing phase II regulation.

PROFESSIONAL/TECHNICAL SOCIETIES:

American Society of Civil Engineers.

LORI L. STOLL

EDUCATION:

M.S., Chemical Engineering, University of Wisconsin, Madison, Wisconsin, 1983.

B.S., Chemical Engineering, University of Wisconsin, Madison, Wisconsin, 1980.

EXPERIENCE:

Chemical Engineer, Radian Corporation, McLean, Virginia, 1983-Present.

Graduate Assistant, Department of Chemical Engineering, University of Wisconsin, Madison, Wisconsin, 1981-1983.

Teaching Assistant, Department of Chemical Engineering, University of Wisconsin, Madison, Wisconsin, 1980-1982.

Undergraduate Assistant, Department of Chemical Engineering, University of Wisconsin, Madison, Wisconsin, 1978-1980.

Pre-Professional Engineer, IBM, Rochester, Minnesota, Summer 1979.

RELEVANT EXPERIENCE:

Ms. Stoll is currently the chemical engineer for two USAF Phase I Record Searches. These analyze past hazardous waste disposal practices and their potential for release and/or migration of pollutants at USAF bases and properties.

Ms. Stoll is also assisting with estimation of VOC emissions from the commercial/residential sector as part of a project sponsored by the Department of Energy's interagency task force on acid rain.

Ms. Stoll recently took part in solid waste sampling efforts, part of a project aimed at solid waste characterization in the ferroalloy industry for EPA's Office of Solid Waste.

During the past year, Ms. Stoll has participated in several aspects of the development of effluent regulations in the nonferrous metals manufacturing industries, part of a project sponsored by EPA's Effluent Guidelines Division (EGD). Ms. Stoll is providing technical engineering support as required to EPA personnel on issues raised during litigation of the aluminum forming point source category effluent regulations. This work has included data evaluation, wastewater treatment technology evaluation, and data base development.

As a part of the same EGD project, Ms. Stoll has participated in efforts to develop estimates of the costs of compliance with proposed effluent regulations in the nonferrous metals manufacturing (phase I and phase II), nonferrous forming, aluminum forming, and metal molding and casting point source categories. Ms. Stoll has assisted with modifications to a computer cost model, data preparation, wastewater treatment system design, and preparation of a cost model user's manual. In addition, Ms. Stoll assisted in efforts to develop and revise pollutant removal estimates for the nonferrous metals manufacturing (phase II) and aluminum forming categories.

Ms. Stoll has also assisted in the development of the interim final effluent limitations guidelines for the aluminum forming point source category. In addition to those mentioned above, her responsibilities included assistance with revision of the development document and organization of technical documentation for inclusion in the public record.

Ms. Stoll assisted in the development of costs of compliance estimates for the lead subcategory of the battery manufacturing industry. She also organized cost model documentation for inclusion in the battery manufacturing public record.

At the University of Wisconsin, Ms. Stoll performed research on flow and solute transport in groundwater. Field tracer test data were used in a mathematical model to develop estimates of the groundwater velocity, dispersive mixing length, and porosity of an aquifer. Ms. Stoll was also involved in a study of the ventilation of the chemical engineering building. She conducted tracer tests and analyzed air samples via gas chromatography to determine the adequacy of the existing ventilation system.

While at IBM, Ms. Stoll conducted a designed experiment to characterize the operation of a disk lubricator, one step in the disk manufacturing process.

PROFESSIONAL/TECHNICAL SOCIETIES:

American Geophysical Union.

Tau Beta Pi.

APPENDIX B

List of Interviewees

(Base Personnel and Outside Agency Contacts)

BASE PERSONNEL

Organization	Shop Affiliation	Years at Plattsburgh AFB
380 AMS	Flight Simulators	3
380 FMS	Corrosion Control	3
380 FMS	Fabrication Branch	NA
380 FMS	NDI	NA
380 FMS	Wheel and Tire	1
380 FMS	Jet Engine Test Cell	NA
380 FMS	Tool Crib and Supply	4
380 MMS	Equipment Maintenance	4
380 MMS	Bench Dock	1
380 OMS	Support	2
380 OMS	Support	3
380 CES	Entomology	1
380 CES	Fire Department	20
380 CES	Civil Engineering	29
380 CES	Pavements and Grounds	26
380 CES	Pavements and Grounds	24
380 CES	Plumbing	19
380 CES	Environmental Engineering	7
380 CES	Environmental Engineering	1
380 CES	Central Heating	29
380 CES	Heat Shop	28
380 CES	Operations	29
380 CES	Water and Wastes	15
380 CES	Mechanical Section	27
380 Supply	Bulk Fuels	1
380 Trans	Vehicle Maintenance	1
USAF Hospital	Bioenvironmental Engineering	3

BASE PERSONNEL (Continued)

Organization	Shop Affiliation	Years at Plattsburgh AFB
DLA	DPDO	10
Retired	Pavements and Grounds	29
Retired	Pavements and Grounds	28
Retired	Refuse Collection	29

NA - Not Available

OUTSIDE AGENCY CONTACTS

Name	Affiliation/Location
Diane Neuhaus	New York State Department of Environmental Conservation, Water Resources Division, Albany, New York
Wiley LaVigne	New York State Department of Environmental Conservation, Region 5 Headquarters, Raybrook, New York
Val Krawiecki	U.S.D.A. Soil Conservation Service, Clinton County District Office, Plattsburgh, New York
Lloyd Wagner	U.S. Geological Survey, Water Resources Division, Albany, New York
Don Malone	Clinton County Office of Land Planning, Plattsburgh, New York
Walter Young	Lake Champlain - Lake George Regional Planning Board, Lake George Institute, Lake George, New York
	Plattsburgh Chamber of Commerce
Mr. Miller	City Engineer, City of Plattsburgh

APPENDIX C

Hazard Assessment Rating Methodology (HARM) Used on Plattsburgh AFB

USAF INSTALLATION RESTORATION PROGRAM

HAZARD ASSESSMENT RATING METHODOLOGY

BACKGROUND

The Department of Defense (DOD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DOD facilities. One of the actions required under this program is to:

> "develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts." (Reference: DEQPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Records Search phase of its Installation Restoration Program (IRP).

The first site rating model was developed in June 1981 at a meeting with representatives from USAF Occupational Environmental Health Laboratory (OEHL), Air Force Engineering Services Center (AFESC), Engineering Science (ES) and CH_2M Hill. The basis for this model was a system developed for EPA by JRB Associates of McLean, Virginia. The JRB model was modified to meet Air Force needs.

After using this model for six months at over 20 Air Force installations, certain inadequacies became apparent. Therefore, on January 26 and 27, 1982, representatives of USAF OEHL, AFESC, various major commands, Engineering Science, and CH_2M Hill met to address the inadequacies. The result of the meeting was a new site rating model designed to present a better picture of the hazards posed by sites at Air Force installations. The new rating model described in this presentation is referred to as the Hazard Assessment Rating Methodology.

PURPOSE

The purpose of the site rating model is to provide a relative ranking of sites of suspected contamination from hazardous substances. This model will assist the Air Force in setting priorities for follow-on site investigations and confirmation work under Phase II of IRP.

This rating system is used only after it has been determined that (1) potential for contamination exists (hazardous wastes present in sufficient quantity), and (2) potential for migration exists. A site can be deleted from consideration for rating on either basis.

DESCRIPTION OF MODEL

Like the other hazardous waste site ranking models, the U.S. Air Force's site rating model uses a scoring system to rank sites for priority attention. However, in developing this model, the designers incorporated some special features to meet specific DOD program needs.

The model uses data readily obtained during the Record Search portion (Phase I) of the IRP. Scoring judgments and computations are easily made. In assessing the hazards at a given site, the model develops a score based on the most likely routes of contamination and the worst hazards at the site. Sites are given low scores only if there are clearly no hazards at the site. This approach meshes well with the policy for evaluating and setting restrictions on excess DOD properties.

As with the previous model, this model considers four aspects of the hazard posed by a specific site: the possible receptors of the contamination, the waste and its characteristics, potential pathways for waste contaminant migration, and any efforts to contain the contaminants. Each of these categories contains a number of rating factors that are used in the overall hazard rating.

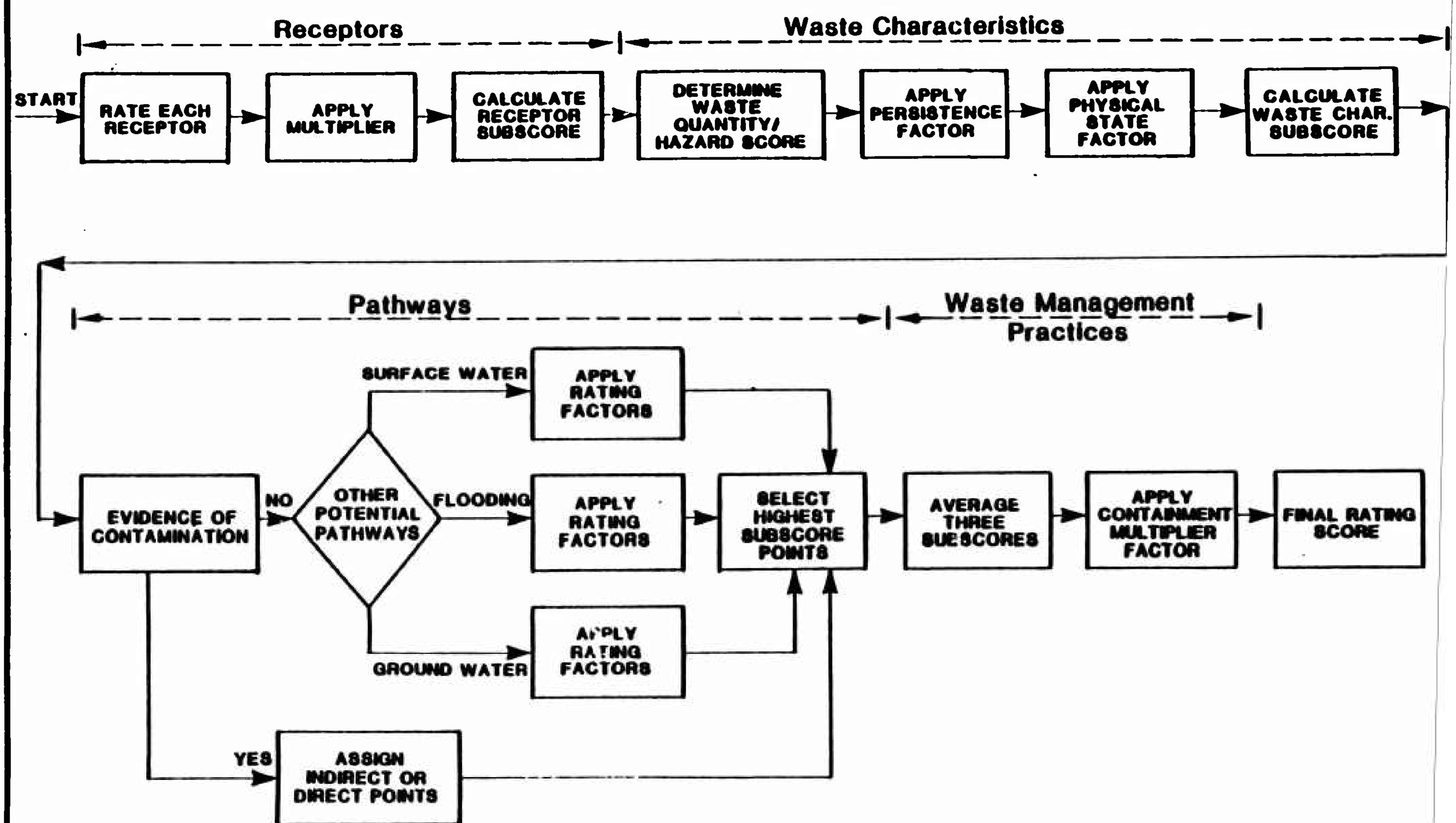
The receptors category rating is calculated by scoring each factor, multiplying by a factor weighting constant and adding the weighted scores to obtain a total category score.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned and for direct evidence 100 points are assigned. If no evidence is found, the highest score among three possible routes is used. These routes are surface water migration, flooding, and groundwater migration. Evaluation of each route involves factors associated with the particular migration route. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The waste characteristics category is scored in three steps. First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The scores for each of the three categories are then added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Sites at which there is no containment are not reduced in score. Scores for sites with limited containment can be reduced by five percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste management practices category factor to the sum of the scores for the other three categories.

HAZARD ASSESSMENT RATING METHODOLOGY FLOW CHART



HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE ____________________

LOCATION ____________________

DATE OF OPERATION OR OCCURRENCE ____________________

OWNER/OPERATOR ____________________

COMMENTS/DESCRIPTION ____________________

SITE RATED BY ____________________

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site		4		
B. Distance to nearest well		10		
C. Land use/zoning within 1 mile radius		3		
D. Distance to reservation boundary		6		
E. Critical environments within 1 mile radius of site		10		
F. Water quality of nearest surface water body		6		
G. Ground water use of uppermost aquifer		9		
H. Population served by surface water supply within 3 miles downstream of site		6		
I. Population served by ground-water supply within 3 miles of site		6		
		Subtotals	______	______

Receptors subscore (100 X factor score subtotal/maximum score subtotal) ______

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) ______
2. Confidence level (C = confirmed, S = suspected) ______
3. Hazard rating (H = high, M = medium, L = low) ______

Factor Subscore A (from 20 to 100 based on factor score matrix) ______

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

______ X ______ = ______

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

______ X ______ = ______

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore ______

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-wate migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		

Subtotals ______ ______

Subscore (100 X factor score subtotal/maximum score subtotal) ______

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding		1		

Subscore (100 x factor score/3) ______

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		

Subtotals ______ ______

Subscore (100 x factor score subtotal/maximum score subtotal) ______

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore ______

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors ______
Waste Characteristics ______
Pathways ______

Total ______ divided by 3 = ______
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

______ X ______ = ______

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES

1. **RECEPTORS CATEGORY**

Rating Factors	Rating Scale Levels: 0	1	2	3	Multiplier
A. Population within 1,000 feet (includes on-base facilities)	0	1-25	26-100	Greater than 100	4
B. Distance to nearest water well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet	10
C. Land Use/Zoning (within 1-mile radius)	Completely remote (zoning not applicable)	Agricultural	Commercial or Industrial	Residential	3
D. Distance to installation boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet	6
E. Critical environments (within 1-mile radius)	Not a critical environment	Natural areas	Pristine natural areas; minor wetlands; preserved areas; presence of economically important natural resources susceptible to contamination	Major habitat of an endangered or threatened species; presence of recharge area; major wetlands	10
F. Water quality/use designation of nearest surface water body	Agricultural or Industrial use	Recreation, propagation and management of fish and wildlife	Shellfish propagation and harvesting	Potable water supplies	6
G. Ground-water use of uppermost aquifer	Not used, other sources readily available	Commercial, industrial, or irrigation, very limited other water sources	Drinking water, municipal water available	Drinking water, no municipal water available; commercial, industrial, or irrigation, no other water source available	9
H. Population served by surface water supplies within 3 miles downstream of site	0	1-15	51-1,000	Greater than 1,000	6
I. Population served by aquifer supplies within 3 miles of site	0	1-50	51-1,000	Greater than 1,000	6

II. WASTE CHARACTERISTICS

A-1 Hazardous Waste Quantity

S = Small quantity (5 tons or 20 drums of liquid)
M = Moderate quantity (5 to 20 tons or 21 to 85 drums of liquid)
L = Large quantity (20 tons or 85 drums of liquid)

A-2 Confidence Level of Information

C = Confirmed confidence level (minimum criteria below)

- o Verbal reports from interviewer (at least 2) or written information from the records
- o Knowledge of types and quantities of wastes generated by shops and other areas on base

S = Suspected confidence level

- o No verbal reports or conflicting verbal reports and no written information from the records
- o Logic based on a knowledge of the types and quantities of hazardous wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at a site

A-3 Hazard Rating

Rating Factors	Rating Scale Levels 0	1	2	3
Toxicity	Sax's Level 0	Sax's Level 1	Sax's Level 2	Sax's Level 3
Ignitability	Flash point greater than 200°F	Flash point at 140°F to 200°F	Flash point at 80°F to 140°F	Flash point less than 80°F
Radioactivity	At or below background levels	1 to 3 times background levels	3 to 5 times background levels	Over 5 times background levels

Use the highest individual rating based on toxicity, ignitability and radioactivity and determine the hazard rating.

Hazard Rating	Points
High (H)	3
Medium (M)	2
Low (L)	1

II. WASTE CHARACTERISTICS--Continued

Waste Characteristics Matrix

Point Rating	Hazardous Waste Quantity	Confidence Level of Information	Hazard Rating
100	L	C	H
80	L	C	M
	M	C	H
70	L	S	H
60	S	C	H
	M	C	M
50	L	S	M
	L	C	L
	M	S	H
	S	C	M
40	S	S	H
	M	S	M
	M	C	L
	L	S	L
30	S	C	L
	M	S	L
	S	S	M
20	S	S	L

Notes:
For a site with more than one hazardous waste, the waste quantities may be added using the following rules:
Confidence Level
- o Confirmed confidence levels (C) can be added.
- o Suspected confidence levels (S) can be added.
- o Confirmed confidence levels cannot be added with suspected confidence levels.

Waste Hazard Rating
- o Wastes with the same hazard rating can be added.
- o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM designation (60 points). By adding the quantities of each waste, the designation may change to LCM (80 points). In this case, the correct point rating for the waste is 80.

B. Persistence Multiplier for Point Rating

Persistence Criteria	Multiply Point Rating From Part A by the Following
Metals, polycyclic compounds, and halogenated hydrocarbons	1.0
Substituted and other ring compounds	0.9
Straight chain hydrocarbons	0.8
Easily biodegradable compounds	0.4

C. Physical State Multiplier

Physical State	Multiply Point Total From Parts A and B by the Following
Liquid	1.0
Sludge	0.75
Solid	0.50

III. PATHWAYS CATEGORY

A. Evidence of Contamination

Direct evidence is obtained from laboratory analyses of hazardous contaminants present above natural background levels in surface water, ground water, or air. Evidence should confirm that the source of contamination is the site being evaluated.

Indirect evidence might be from visual observation (i.e., leachate), vegetation stress, sludge deposits, presence of taste and odors in drinking water, or reported discharges that cannot be directly confirmed as resulting from the site, but the site is greatly suspected of being a source of contamination.

B-1 Potential for Surface Water Contamination

Rating Factors	Rating Scale Levels: 0	1	2	3	Multiplier
Distance to nearest surface water (includes drainage ditches and storm sewers	Greater than 1 mile	2,001 feet to 1 mile	501 feet to 2,000 feet	0 to 500 feet	8
Net precipitation	Less than -10 inches	-10 to +5 inches	+5 to +20 inches	Greater than +20 inches	6
Surface erosion	None	Slight	Moderate	Severe	8
Surface permeability	0% to 15% clay ($>10^{-2}$ cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	Greater than 50% clay ($<10^{-6}$ cm/sec)	6
Rainfall intensity based on 1-year 24-hour rainfall (Thunderstorms)	<1.0 inch	1.0 to 2.0 inches	2.1 to 3.0 inches	>3.0 inches	8

B-2 Potential for Flooding

Rating Factors	0	1	2	3	Multiplier
Floodplain	Beyond 100-year floodplain	In 100-year floodplain	In 10-year floodplain	Floods annually	1

B-3 Potential for Ground-Water Contamination

Rating Factors	0	1	2	3	Multiplier
Depth to ground water	Greater than 500 feet	50 to 500 feet	11 to 50 feet	0 to 10 feet	8
Net precipitation	Less than -10 inches	-10 to +5 inches	+5 to + 20 inches	Greater than +20 inches	6
Soil permeability	Greater than 50% clay ($<10^{-6}$ cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	0% to 15% clay ($>10^{-2}$ cm/sec)	8

B-3 Potential for Ground-Water Contamination--Continued

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
Subsurface flows	Bottom of site greater than 5 feet above high ground-water level	Bottom of site occasionally submerged	Bottom of site frequently submerged	Bottom of site located located below mean ground-water level	8
Direct access to ground water (through faults, fractures, faulty well casings, subsidence, fissures, etc.)	No evidence of risk	Low risk	Moderate risk	High risk	8

IV. WASTE MANAGEMENT PRACTICES CATEGORY

A. This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores.

B. Waste Management Practices Factor

The following multipliers are then applied to the total risk points (from A):

Waste Management Practice	Multiplier
No containment	1.0
Limited containment	0.95
Fully contained and in full compliance	0.10

Guidelines for fully contained:

Landfills:

- o Clay cap or other impermeable cover
- o Leachate collection system
- o Liners in good condition
- o Adequate monitoring wells

Surface Impoundments:

- o Liners in good condition
- o Sound dikes and adequate freeboard
- o Adequate monitoring wells

Spills:

- o Quick spill cleanup action taken
- o Contaminated soil removed
- o Soil and/or water samples confirm total cleanup of the spill

Fire Protection Training Areas:

- o Concrete surface and berms
- o Oil/water separator for pretreatment of runoff
- o Effluent from oil/water separator to treatment plant

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-1, or III-B-3, then leave blank for calculation of factor score and maximum possible score.

APPENDIX D

HARM Form for Rated Sites,
Plattsburgh AFB

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-3 JP-4 and Solvent Spills

LOCATION SAC Flightline, Ramp and Adjacent Industrial Area

DATE OF OPERATION OR OCCURRENCE 1955 to Present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION Rating factors applied at center of Ramp

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	2	6	12	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	2	6	12	18
		Subtotals	89	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 49.4

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) L
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 100

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

100 x 1.0 = 100

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

100 x 1.0 = 100

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 100

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		
Subtotals				

Subscore (100 X factor score subtotal/maximum score subtotal) ____

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding		1		

Subscore (100 x factor score/3) ____

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		
Subtotals				

Subscore (100 x factor score subtotal/maximum score subtotal) ____

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 100

IV WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	49.4
Waste Characteristics	100
Pathways	100

Total 249.4 divided by 3 = 83.1 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

83.1 x 0.95 = 78.9

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-8 Fuel Spills

LOCATION POL Storage Area

DATE OF OPERATION OR OCCURRENCE 1955 to Present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	2	6	12	18
Subtotals			95	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 52.8

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) L
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 100

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

100 x 0.9 = 90

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

90 x 1.0 = 90

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 100

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		
Subtotals				

Subscore (100 X factor score subtotal/maximum score subtotal) ______

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding		1		

Subscore (100 x factor score/3) ______

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		
Subtotals				

Subscore (100 x factor score subtotal/maximum score subtotal) ______

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 100

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	52.8
Waste Characteristics	90
Pathways	100

Total 242.8 divided by 3 = 80.9
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

80.9 x 0.95 = $\boxed{76.9}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-9 Solvent Spills

LOCATION MMS Industrial Complex north of WSA

DATE OF OPERATION OR OCCURRENCE 1955 to Present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	2	4	8	12
B. Distance to nearest well	2	10	20	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to reservation boundary	2	6	12	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	3	6	18	18
Subtotals			98	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 54.4

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 60

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

60 x 0.9 = 54

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

54 x 1.0 = 54

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 100

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		
Subtotals				

Subscore (100 X factor score subtotal/maximum score subtotal) ____

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding		1		

Subscore (100 x factor score/3) ____

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		
Subtotals				

Subscore (100 x factor score subtotal/maximum score subtotal) ____

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 100

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	54.4
Waste Characteristics	54
Pathways	100

Total 208.4 divided by 3 = 69.5
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

69.5 x 1.0 = $\boxed{69.5}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-10 JP-4 Spills

LOCATION Alert Area (north end of Ramp)

DATE OF OPERATION OR OCCURRENCE 1955 to Present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	2	6	12	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	83	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 46.1

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) L
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 100

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

100 x 0.9 = 90

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

90 x 1.0 = 90

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 80

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	3	6	18	18
Surface erosion	0	8	0	24
Surface permeability	3	6	18	18
Rainfall intensity	2	8	16	24
		Subtotals	76	108

Subscore (100 X factor score subtotal/maximum score subtotal) 70.4

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	3	6	18	18
Soil permeability	0	8	0	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	42	114

Subscore (100 x factor score subtotal/maximum score subtotal) 36.8

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 80

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	46.1
Waste Characteristics	90
Pathways	80

Total 216.1 divided by 3 = 72.0 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

72.0 x 0.95 = $\boxed{68.4}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site FT-1 Fire Training Area

LOCATION Southeast of Small Arms Range

DATE OF OPERATION OR OCCURRENCE 1955 to Present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION Three fire pits, one inactive since 1975

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	0	4	0	12
B. Distance to nearest well	3	10	30	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	97	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 53.9

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) L
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 100

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

100 x 0.9 = 90

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

90 x 1.0 = 90

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	2	8	16	24
Net precipitation	3	6	18	18
Surface erosion	0	8	0	24
Surface permeability	3	6	18	18
Rainfall intensity	2	8	16	24
		Subtotals	68	108

Subscore (100 X factor score subtotal/maximum score subtotal) 63.0

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	2	8	16	24
Net precipitation	3	6	18	18
Soil permeability	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	58	114

Subscore (100 x factor score subtotal/maximum score subtotal) 50.9

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 63.0

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	53.9
Waste Characteristics	90
Pathways	63.0

Total 206.9 divided by 3 = 69.0 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

69.0 x 0.95 = 65.6

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site D-4

LOCATION South of Fire Training Area

DATE OF OPERATION OR OCCURRENCE 1966-1979

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION Last active landfill area on-base

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	0	4	0	12
B. Distance to nearest well	3	10	30	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
Subtotals			97	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 53.9

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 40

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

40 x 1.0 = 40

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

40 x 1.0 = 40

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	2	8	16	24
Net precipitation	3	6	18	18
Surface erosion	0	8	0	24
Surface permeability	0	6	0	18
Rainfall intensity	2	8	16	24
Subtotals			50	108

Subscore (100 X factor score subtotal/maximum score subtotal) 46.3

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	3	6	18	18
Soil permeability	3	8	24	24
Subsurface flows	2	8	16	24
Direct access to ground water	3	8	24	24
Subtotals			106	114

Subscore (100 x factor score subtotal/maximum score subtotal) 93.0

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 93.0

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	53.9
Waste Characteristics	40
Pathways	93.0

Total 186.9 divided by 3 = 62.3 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

62.3 x 1.0 = 62.3

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-6 JP-4 Spills

LOCATION AF Vehicle Maintenance Building 2542

DATE OF OPERATION OR OCCURRENCE 1955 to Present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION

SITE RATED BY MAZ, AMO

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	2	6	12	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	83	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 46.1

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) L
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 70

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

70 x 0.9 = 63

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

63 x 1.0 = 63

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	3	6	18	18
Surface erosion	0	8	0	24
Surface permeability	0	6	0	18
Rainfall intensity	2	8	16	24
Subtotals			58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 53.7

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	3	6	18	18
Soil permeability	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
Subtotals			66	114

Subscore (100 x factor score subtotal/maximum score subtotal) 57.9

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 57.9

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	46.1
Waste Characteristics	63
Pathways	57.9

Total 167.0 divided by 3 = 55.7
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

55.7 x 1.0 = $\boxed{55.7}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-2, Number 2 Heating Fuel Spill

LOCATION Building 205

DATE OF OPERATION OR OCCURRENCE 1982

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION Underground tank leak

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	0	10	0	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
Subtotals			79	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 43.9

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 60

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

60 x 0.9 = 54

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

54 x 1.0 = 54

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	3	6	18	18
Surface erosion	0	8	0	24
Surface permeability	0	6	0	18
Rainfall intensity	2	8	16	24
Subtotals			58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 53.7

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	3	6	18	18
Soil permeability	3	8	24	24
Subsurface flows	1	8	8	24
Direct access to ground water	0	8	0	24
Subtotals			74	114

Subscore (100 x factor score subtotal/maximum score subtotal) 64.9

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 64.9

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	43.9
Waste Characteristics	54
Pathways	64.4

Total 162.8 divided by 3 = 54.3 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

54.3 x 1.0 = 54.3

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-12 New Product Drum Storage Area

LOCATION Outside northwest corner of Building 2890

DATE OF OPERATION OR OCCURRENCE Unknown to Present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	2	6	12	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
Subtotals			83	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 46.1

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 60

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

60 x 0.8 = 48

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

48 x 1.0 = 48

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	3	6	18	18
Surface erosion	1	8	8	24
Surface permeability	0	6	0	18
Rainfall intensity	2	8	16	24
Subtotals			66	108

Subscore (100 X factor score subtotal/maximum score subtotal) 61.1

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	3	6	18	18
Soil permeability	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
Subtotals			66	114

Subscore (100 x factor score subtotal/maximum score subtotal) 57.9

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 61.1

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	46.1
Waste Characteristics	48
Pathways	61.1
Total 155.2 divided by 3 =	51.7
	Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

51.7 x 1.0 = $\boxed{51.7}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-11, Engine Oil Spills

LOCATION New Base Housing Area

DATE OF OPERATION OR OCCURRENCE Unknown to Present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION Rating factors applied at Maine Rd and N Dakota Ave intersection

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
		Subtotals	89	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 49.4

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) L

Factor Subscore A (from 20 to 100 based on factor score matrix) 30

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

30 x 0.8 = 24

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

24 x 1.0 = 24

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 80

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	3	6	18	18
Surface erosion	0	8	0	24
Surface permeability	3	6	18	18
Rainfall intensity	2	8	16	24
Subtotals			76	108

Subscore (100 X factor score subtotal/maximum score subtotal) 70.4

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	3	6	18	18
Soil permeability	0	8	0	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
Subtotals			42	114

Subscore (100 x factor score subtotal/maximum score subtotal) 36.8

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 80

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	49.4
Waste Characteristics	24
Pathways	80

Total 153.4 divided by 3 = 51.1
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

51.1 x 1.0 = $\boxed{51.1}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-7, Number 2 Fuel Oil Spill

LOCATION Behind DPDO Office

DATE OF OPERATION OR OCCURRENCE 1983

OWNER/OPERATOR DLA

COMMENTS/DESCRIPTION

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	1	4	4	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	2	6	12	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	2	6	12	18
		Subtotals	81	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 45.0

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 60

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

60 x 0.9 = 54

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

54 x 1.0 = 54

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	3	6	18	13
Surface erosion	0	8	0	24
Surface permeability	0	6	0	18
Rainfall intensity	2	8	16	24
Subtotals			58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 53.7

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	3	6	18	18
Soil permeability	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
Subtotals			66	114

Subscore (100 x factor score subtotal/maximum score subtotal) 57.9

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 57.9

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	45.0
Waste Characteristics	54
Pathways	57.9

Total 156.9 divided by 3 = 52.3
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

52.3 x 0.95 = $\boxed{49.7}$

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-5, JP-4 Spill

LOCATION Southeast section of Flightline Ramp

DATE OF OPERATION OR OCCURRENCE August 1984

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION Isolation Valve Pit

SITE RATED BY MAZ, AMO, LLS

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	2	6	12	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	2	6	12	18
Subtotals			89	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 49.4

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) C
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 60

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

60 x 0.9 = 54

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

54 x 1.0 = 54

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	3	6	18	18
Surface erosion	0	8	0	24
Surface permeability	0	6	0	18
Rainfall intensity	2	8	16	24
		Subtotals	58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 53.7

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	2	8	16	24
Net precipitation	3	6	18	18
Soil permeability	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	58	114

Subscore (100 x factor score subtotal/maximum score subtotal) 50.9

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 53.7

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	49.4
Waste Characteristics	54
Pathways	53.7

Total 157.1 divided by 3 = 52.4
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

52.4 x 0.95 = 49.8

HAZARD ASSESSMENT RATING METHODOLOGY FORM

NAME OF SITE Site SP-13, New and Spent Product Drum Accumulation Area

LOCATION Outside southeast corner of Building 2774

DATE OF OPERATION OR OCCURRENCE Unknown to present

OWNER/OPERATOR PAFB

COMMENTS/DESCRIPTION

SITE RATED BY MAZ, AMO

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	1	10	10	30
C. Land use/zoning within 1 mile radius	3	3	9	9
D. Distance to reservation boundary	2	6	12	18
E. Critical environments within 1 mile radius of site	1	10	10	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	1	6	6	18
Subtotals			83	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 46.1

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C = confirmed, S = suspected) S
3. Hazard rating (H = high, M = medium, L = low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 40

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

40 x 1.0 = 40

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

40 x 1.0 = 40

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	3	6	18	18
Surface erosion	0	8	0	24
Surface permeability	0	6	0	18
Rainfall intensity	2	8	16	24
		Subtotals	58	108

Subscore (100 X factor score subtotal/maximum score subtotal) 53.7

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 x factor score/3) 0

3. Ground-water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	3	6	18	18
Soil permeability	3	8	24	24
Subsurface flows	0	8	0	24
Direct access to ground water	0	8	0	24
		Subtotals	66	114

Subscore (100 x factor score subtotal/maximum score subtotal) 57.9

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 57.9

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	46.1
Waste Characteristics	40
Pathways	57.9

Total 144.0 divided by 3 = 48.0 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

48.0 x 1.0 = $\boxed{48.0}$

APPENDIX E

Master List of Shops

Plattsburgh AFB

Plattsburgh AFB Shop List

Shop Name	Use Hazardous Materials	Generate Hazardous Waste
HQ 380th Bomb Wing	No	No
Deputy Commander for Maintenance	No	No
380th Avionics Maintenance Squadron		
Maintenance Supervision	No	No
Analysis Branch	No	No
Avionics Shop Maintenance Branch	Yes	No
Integrated Avionics Systems Maintenance	Yes	No
KC-135 Avionics Branch	Yes	No
Precision Measurement Equipment Lab	Yes	Yes
Technical Administration Branch	No	No
Training Devices Branch	Yes	Yes
380th Field Maintenance Squadron		
Administration Office/Orderly Room	No	No
Maintenance Supervision	No	No
Aerospace Ground Equipment Branch	Yes	No
Aerospace Systems Branch	Yes	Yes
Fabrication Branch	Yes	Yes
Propulsion Branch	Yes	Yes
Technical Supervision Branch	No	No
380th Munitions Maintenance Squadron		
Explosive Ordnance Disposal Branch	No	No
AFK Supply Branch	No	No
Maintenance Supervision	No	No
Munitions Services Branch	No	No
Integrated Munitions Maintenance and Storage	Yes	Yes
380th Organizational Maintenance Squadron		
Administration Office/Orderly Room	No	No
Maintenance Supervision	No	No
Alert Force Branch	Yes	Yes
Bomber Flightline Branch	Yes	Yes
Tanker Flightline Branch	Yes	Yes
Support Equipment Branch	Yes	Yes
Technical Administration Branch	No	No

Plattsburgh AFB Shop List (Continued)

Shop Name	Use Hazardous Materials	Generate Hazardous Waste
Deputy Commander for Operations	No	No
310th Air Refueling Squadrcn	No	No
380th Air Refueling Squadron	No	No
528th Bomb Squadron	No	No
529th Bomb Squadron	No	No
4007th Combat Crew Training Squadron	No	No
Deputy Commander for Resource Management	No	No
380th Supply Squadron		
Administration Office/Orderly Room	No	No
Supply Division	No	No
Management and Procedures Branch	No	No
Fuels Management Branch	Yes	Yes
Customer Support Branch	No	No
Allowance and Authorization	No	No
Material Management Branch	No	No
Stock Control Section	No	No
Material Storage and Distribution Branch	No	No
Supply Systems Branch	No	No
380th Transportation Squadron		
Administration Office/Orderly Room	No	No
Traffic Management Office	No	No
Vehicle Maintenance Control	Yes	Yes
Vehicle Operations Branch	No	No
USAF Hospital	No	No
HQ 380th Combat Support Group	No	No
Services Squadron	No	No
380th Civil Engineering Squadron	Yes	No
380th Security Police Squadron	No	No

Plattsburgh AFB Shop List (Continued)

Shop Name	Use Hazardous Materials	Generate Hazardous Waste
ACE FOL/E	No	No
AF Audit Agency Det 0357	No	No
AF Commissary Service	No	No
AF Office of Special Investigation	No	No
AF ROTC Field Training	No	No
American Red Cross	No	No
Defense Investigative Service	No	No
Defense Logistics Agency	No	Yes
Det 12 26th Weather Squadron	No	No
Det 18 38ARRS	No	No
Det 19 3904 Management Engineering Squadron	No	No
Det 3 4200 Test and Evaluation Squadron	No	No
Ogden Air Logistic Center/AFLC	No	No
U.S. Army Corps of Engineers	No	No
USAF Area Defense Council	No	No
240th Communications Squadron		
Administration	No	No
Air Traffic Control Operations	No	No
Crew Communications	No	No
C-E Maintenance	Yes	Yes
C-E Programs	No	No
C-E Operations/Telecommunication Operations	No	No
3751 Field Training Squadron Det 210	No	No

APPENDIX F

Inventory of Storage Tanks and Oil/Water Separators
on Plattsburgh AFB

STORAGE TANKS OF LESS THAN 1,000 GALLON CAPACITY[1]

Material	Facility	Capacity (gal)	Description
Mogas	2889	750	AG
Mogas	3582	275	BG
Diesel	2880	750	AG
Diesel	9400	275	AG
Diesel	9700	500	BG

AG - Above ground

BG - Below ground

[1] Does not include heating oil tanks at base housing and industrial areas

STORAGE TANKS OF 1,000 - 10,000 GALLON CAPACITY

Material	Facility	Capacity (gal)	Description
Mogas	2335	7,300	BG
Mogas	2555	8,000	BG*
Mogas	2785	1,200	AG
Mogas	2811	5,000	BG
Mogas	2826	5,000	BG
Diesel	2555	8,000	BG*
Diesel	2826	5,000	BG
JP-4	2785	4,000	AG
JP-4	2812	5,000	BG
JP-4	2820	5,000	BG
JP-4	2883	2,500	AG

BG - Below Ground

AG - Above Ground

*Inactive

STORAGE TANKS WITH CAPACITY OF 10,000 GALLONS OR GREATER

Material	Facility	Capacity (gal)	Description
Mogas	2550	2 tanks at 15,000 each	BG*
Mogas	2551	2 tanks at 10,000 each	AG
Mogas	2552	25,000	BG
Diesel	2553	10,088	AG
Diesel	2558	12,142	BG
Fuel Oil (#2)	2073	840,000	AG
Fuel Oil (#2)	3241	4 tanks at 50,000 each	BG
Fuel Oil (#6)	2662	126,840	AG
Fuel Oil (#6)	2663	420,000	AG
Fuel Oil (#6)	2664	126,840	AG
Deicing Fluid	2065	2 tanks at 25,000 each	BG
Isopropyl Alcohol	2065	25,000	BG
Avgas	3250	2 tanks at 50,000 each	BG*
Avgas	3270	6 tanks at 50,000 each	BG*
JP-4	2075	1,260,000	AG
JP-4	2077	1,260,000	AG
JP-4	3220	6 tanks at 50,000 each	BG
JP-4	3230	6 tanks at 50,000 each	BG
JP-4	3260	6 tanks at 50,000 each	BG
JP-4	3280	6 tanks at 50,000 each	BG
JP-4 Transfer Line	--	176,664	BG

BG - Below Ground
AG - Above Ground
*Inactive

HEAT SHOP 380 CE TANK LISTING

Bldg No.	No. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
100	1 U	2,000	2	
102	1 U	550	2	
104	1 U	8,000	2	
108	2 A	275	2	In basement
112	1 A	550	2	In basement
114	2 A	275	2	In basement
118	2 A	275	2	In basement
122	2 A	275	2	In basement
126	2 A	275	2	In basement
130	2 A	275	2	In basement
134	2 A	275	2	In basement
138	2 A	275	2	In basement
142	2 A	275	2	In basement
146	2 A	275	2	In basement
150	2 A	275	2	In basement
154	2 A	275	2	In basement
160	2 A	275	2	In basement
164	2 A	275	2	In basement
168	2 A	275	2	In basement
172	2 A	275	2	In basement
176	2 A	275	2	In basement
177	1 U	550	2	
180	1 U	1,000	2	
184	2 A	275	2	In basement
188	2 A	275	2	In basement
192	2 A	275	2	In basement

Bldg No.	No. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
200-A	1 U	550	2	
200-B	1 U	550	2	
201-A	1 U	550	2	Fiberglass
201-B	1 U	550	2	Fiberglass
204-A	1 U	550	2	Fiberglass
204-B	1 U	550	2	Fiberglass
205-A	1 U	550	2	Steel tank
205-B	1 U	550	2	Steel tank
208-A	1 U	550	2	Steel tank
208-B	1 U	550	2	Steel tank
209-A	1 U	550	2	Steel tank
209-B	1 U	550	2	Steel tank
212-A	1 U	550	2	Steel and fiberglass
212-B	1 U	550	2	Steel and fiberglass
213-A	1 U	550	2	Fiberglass
213-B	1 U	550	2	Fiberglass
216-A	1 U	550	2	Fiberglass
216-B	1 U	550	2	Fiberglass
217-A	1 U	550	2	Fiberglass
217-B	1 U	550	2	Fiberglass
220-A	1 U	550	2	Steel and fiberglass
220-B	1 U	550	2	Steel and fiberglass
221-A	1 U	550	2	Steel
221-B	1 U	550	2	Steel
224-A	1 U	550	2	Steel and fiberglass
224-B	1 U	550	2	Steel and fiberglass

Bldg No.	No. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
225-A	1 U	550	2	Fiberglass
225-B	1 U	550	2	Fiberglass
229-A	1 U	550	2	Fiberglass
229-B	1 U	550	2	Fiberglass
233-A	1 U	550	2	Steel and fiberglass
233-B	1 U	550	2	Steel and fiberglass
237-A	1 U	550	2	Steel and fiberglass
237-B	1 U	550	2	Steel and fiberglass
241-A	1 U	550	2	Steel and fiberglass
241-B	1 U	550	2	Steel and fiberglass
377	2 U	20,000	2	
379	1 U	10,000	2	
381	1 U	10,000	2	
406	1 U	12,000	4	
414	1 U	12,000	4	
426	1 U	10,000	2	Fiberglass
469	1 U	12,000	4	
476	1 U	550	2	
483	1 U	550	2	
485	1 U	550	2	
492	1 U	1,000	2	
505	1 U	550	2	
508	1 U	1,000	2	
509	1 U	1,000	2	
601	1 U	550	2	
609	1 U	1,000	2	

Bldg No.	No. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
610	1 U	550	2	
613	2 A	275	2	In basement
614	1 U	550	2	
615	2 A	275	2	In basement
639	1 U	550	2	
640	1 U	550	2	
646	1 U	550	2	
652	1 U	1,000	2	
653	1 U	1,000	2	
701	1 U	550	2	
751	1 U	550	2	
800	1 U	550	2	
801	1 U	550	2	
804	1 U	550	2	
805-A	1 U	550	2	
805-B	1 U	550	2	
808	1 U	550	2	
809-A	1 U	550	2	
809-B	1 U	550	2	
812-A	1 U	550	2	
812-B	1 U	550	2	
813-A	1 U	550	2	
813-B	1 U	550	2	
816-A	1 U	550	2	
816-B	1 U	550	2	
817-A	1 U	550	2	
817-B	1 U	550	2	

Bldg No.	No. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
820-A	1 U	550	2	
820-B	1 U	550	2	
821-A	1 U	550	2	
821-B	1 U	550	2	
824-A	1 U	550	2	
824-B	1 U	550	2	
825-A	1 U	550	2	
825-B	1 U	550	2	
828-A	1 U	550	2	
828-B	1 U	550	2	
829-A	1 U	550	2	
829-B	1 U	550	2	
832-A	1 U	550	2	
832-B	1 U	550	2	
833-A	1 U	550	2	
833-B	1 U	550	2	
836-A	1 U	550	2	
836-B	1 U	550	2	
837-A	1 U	550	2	
837-B	1 U	550	2	
840-A	1 U	550	2	
840-B	1 U	550	2	
841-A	1 U	550	2	
841-B	1 U	550	2	
844-A	1 U	550	2	
844-B	1 U	550	2	

Bldg No.	No. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
845-A	1 U	550	2	Steel and fiberglass
845-B	1 U	550	2	
848-A	1 U	550	2	
848-B	1 U	550	2	
849-A	1 U	550	2	
849-B	1 U	550	2	
851-A	1 U	550	2	
851-B	1 U	550	2	
852-A	1 U	550	2	
852-B	1 U	550	2	
855-A	1 U	550	2	
855-B	1 U	550	2	
856-A	1 U	550	2	
856-B	1 U	550	2	
859-A	1 U	550	2	
859-B	1 U	550	2	
860-A	1 U	550	2	
860-B	1 U	550	2	
861-A	1 U	550	2	
861-B	1 U	550	2	
864-A	1 U	550	2	
864-B	1 U	550	2	
865-A	1 U	550	2	Steel and fiberglass
865-B	1 U	550	2	Steel and fiberglass
868-A	1 U	550	2	
868-B	1 U	550	2	

Bldg No.	o. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
869-A	1 U	550	2	Fiberglass
869-B	1 U	550	2	Fiberglass
871-A	1 U	550	2	Fiberglass
871-B	1 U	550	2	Fiberglass
872-A	1 U	550	2	Fiberglass
872-B	1 U	550	2	Fiberglass
875-A	1 U	550	2	Steel and fiberglass
875-B	1 U	550	2	Steel and fiberglass
876-A	1 U	550	2	
876-B	1 U	550	2	
879-A	1 U	550	2	Fiberglass
879-B	1 U	550	2	Fiberglass
880-A	1 U	550	2	
880-B	1 U	550	2	
881-A	1 U	550	2	Fiberglass
881-B	1 U	550	2	Fiberglass
884-A	1 U	550	2	
884-B	1 U	550	2	
885-A	1 U	550	2	Fiberglass
885-B	1 U	550	2	Fiberglass
888-A	1 U	550	2	
888-B	1 U	550	2	
889	1 U	550	2	
891	1 U	550	2	
892-A	1 U	550	2	
892-B	1 U	550	2	
895	1 U	550	2	

Bldg No.	No. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
896-A	1 U	550	2	
896-B	1 U	550	2	
900-A	1 U	550	2	
900-B	1 U	550	2	
904-A	1 U	550	2	Fiberglass
904-B	1 U	550	2	Fiberglass
908-A	1 U	550	2	Steel and fiberglass
908-B	1 U	550	2	Steel and fiberglass
912-A	1 U	550	2	Steel and fiberglass
912-B	1 U	550	2	Steel and fiberglass
916-A	1 U	550	2	Steel and fiberglass
916-B	1 U	550	2	Steel and fiberglass
920-A	1 U	550	2	Steel and fiberglass
920-B	1 U	550	2	Steel and fiberglass
924-A	1 U	550	2	Steel and fiberglass
924-B	1 U	550	2	Steel and fiberglass
928-A	1 U	550	2	Fiberglass
928-B	1 U	550	2	Fiberglass
932-A	1 U	550	2	
932-B	1 U	550	2	Fiberglass
936-A	1 U	550	2	Steel and fiberglass
936-B	1 U	550	2	Steel and fiberglass
940-A	1 U	550	2	Steel and fiberglass
940-B	1 U	550	2	Steel and fiberglass
944	1 U	550	2	Steel and fiberglass
948	1 U	550	2	Fiberglass
952	1 U	550	2	Fiberglass

Bldg No.	No. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
956	1 U	550	2	Steel and fiberglass
964	1 U	550	2	Fiberglass
1700	1 A	550	2	
1806/1808	1 U	550	2	
1807/1810	1 U	550	2	
1809	2 U	550	2	
1815	1 U	1,500	2	
2009	1 U	300	2	
2335	1 U	550	2	
2385	1 U	1,000	2	
2565	1 U	550	2	
2624	1 U	2,000	2	
2658	1 U	20,000	6	Day tank
2662	1 A	126,481	6	Bulk storage
2663	1 A	423,323	6	Bulk storage
2664	1 A	126,512	6	Bulk storage
2820	1 U	550	2	Not in use
3001	1 U	550	2	
3225			LPG	
3400	1 U	5,000	2	Not in use
3569	1 U	1,000	2	
3570	1 U	1,000	2	
3578	1 U	2,000	2	
3580	1 U	1,000	2	
3582	1 U	750	2	
3584	1 U	1,000	2	Not in use

Bldg No.	o. of Tanks A-Above ground U-Underground	Capacity	Type of Fuel	Remarks
3586	1 U	550	2	
3592	1 U	550	2	
9100	1 U	1,000	2	
9200	1 U	1,000	2	Not in use

Fuel type key:

2 - Number 2 Heating Oil
4 - Number 4 Heating Oil
LPG - Liquid Propane Gas

OIL/WATER SEPARATOR INVENTORY

1. Old Base
   Auto Hobby Shop, Bldg 509, 250 gal capacity, monthly service

2. New Base

   a. Transportation Squadron

      (1) General Purpose Shop, Bldg 2540, 550 gal capacity, monthly service

      (2) Refueling Maintenance Shop, Bldg 2542, 1000 gal capacity, monthly service

      (3) Allied Trades Paint Shop, Bldg 2545

      (4) Vehicle Maintenance Shop, Bldg 2548, 280 gal capacity, monthly service

   b. Flightline Area

      (1) Power Check Pad, Bldg 2700, 2000 gal capacity, serviced every 3 months

      (2) Fire Station, Bldg 2748, 500 gal capacity, monthly service

      (3) FMS Building South, Bldg 2753, 500 gal capacity, monthly service

      (4) FMS Building North, Bldg 2753, 500 gal capacity, monthly service

      (5) Black Hangar East, Bldg 2763, 275 gal capacity, monthly service

      (6) Propulsion Branch West-1, Bldg 2774, 400 gal capacity, monthly service

      (7) Propulsion Branch West-2, Bldg 2774, 400 gal capacity monthly service

      (8) Nose Dock 4, Bldg 2785, 500 gal capacity, monthly service

      (9) AGE, Bldg 2815

      (10) Nose Dock 5 East, Bldg 2818, 5000 gal capacity, serviced every 3 months

      (11) Nose Dock 5 West, Bldg 2818, 5000 gal capacity, serviced every 3 months

(12) Jet Engine Test Cell, Bldg 2820, 400 gal capacity, monthly service

(13) Snow Barn, Bldg 2827, 400 gal capacity, monthly service

c. Army and Air Force Exchange Service (AAFES)

(1) Base Filling Station, Bldg 2335

APPENDIX G

Supplemental Environmental Data

WATER MONITORING LOCATIONS

Site identification code: 0159-NS-001

Site description: Storm drain effluent, no longer monitored, assumption made that no additional pollution will enter stream between the flightline storm drain outfall and the first holding pond approximately 60 yards downstream. Thus, monitoring will occur at the first holding pond to document pollution input from flightline activities.

Site identification code: 0159-NS-002

Site description: First holding pond in golf course stream

Site identification code: 0159-NS-003

Site description: Golf course stream effluent, exit point just upstream of railroad bridge.

Site identification code: 0159-NS-004

Site description: WSA/Salmon River, SQ boundary, effluent from WSA area and flightline drainage.

Site identification code: 0159-NS-005

Site description: Holding pond for maintenance facilities effluents, east of Hole 3 tee.

Site identification code: 0159-NS-006

Site description: Off base drainage/stream influent to golf course, SE boundary near fairway #7

Site identification code: 0159-NS-007

Site description: Alert facility area NW of FB-111 shelters, potential fuel spill effluent only, sample site off base at Saranac River outfall.

Site identification code: 0159-NS-008

Site description: Bulk storage facility (near east gate), potential spill effluent only.

CHRONOLOGICAL DATA RESULTS - EAST BOUNDARY INFLUENT (HOLDING POND) (0159-NS-003)							
DATE SAMPLE TAKEN	TOTAL KJELDAHL NITROGEN (mg/l)	OIL AND GREASES (mg/l)	PHOSPHORUS (mg/l)	CALCIUM (mg/l)	IRON (µg/l)	SURFACTANT (mg/l)	
JULY 79	<1.0	<0.3	<0.2	36.4	1538	NA	
OCT 79	<1.0	<0.3	<0.2	13.6	140	<0.1	
APR 80	<1.0	<0.[illegible]	<0.2	20.2	161	<0.1	
JULY 80	1.0	<0.3	<0.2	BIT	BIT	0.1	
JUNE 82	[illegible]	6.8	<0.1	31.[illegible]	784	<0.1	
OCT 82	NA	<0.3	NA	37.7	5200	<0.1	
JAN 83	NA	0.7	NA	NA	NA	NA	
MAR 83	SPECIAL REQUEST - CHEMICAL OXYGEN DEMAND (COD) - [illegible] mg/l.					NA	
MAR 83	NA	28.0	NA	NA	NA	NA	
MAR 83	SPECIAL REQUEST - UNKNOWN SUBSTANCE SHOWN TO BE CALCIUM CARBONATE					NA	
MAR 83	SPECIAL REQUEST - OIL FOUND IN POND PROVED TO BE MIL 7808 JET ENGINE OIL.					NA	
SEPT 83	1.5	<0.3	NA	NA	NA	NA	
OCT 83	SPECIAL REQUEST - ANALYZED FOR OIL & GREASES - 9.9 mg/l				NA	NA	
	VOLATILE HALOCARBONS	VOLATILE AROMATICS	OILS & GREASES	KJEDAHL NITROGEN	ETHYLENE GLYCOL	pH	PHE[illegible]
JUNE 84	2.1 µg/l ~~Carbontetrachloride~~ chloroform 0.8 µg/l TCE	3.9 µg/l MEK	0.36 mg/l	6.2 mg/l	NOT ACCOMPLISHED	7.8	<1[illegible]
<0.2 <0.2	TRACE Tetrachloroethylene TRACE Methylene Chloride						
JULY 84	NO	ND	2.5 mg/l	6.4 mg/l	<10 mg/L	8.2	<1[illegible]
AUG 84	1,2-Dichloroethane 1.4 µg Methylene chloride 0.5 µg	ND	<.3 mg/l	5.3 mg/l	121 mg/l	8.0	<1[illegible]
Sept.			B.t	4.3 mg/l	<10 mg/l	8.4	<10

CHRONOL -ICAL DATA RESULTS - EAST BOUNDARY EFFLUENT (LEAVING BASE) 0159-NS-

DATE SAMPLE TAKEN	TOTAL KJELDAHL NITROGEN (mg/l)	OIL AND GREASES (mg/l)	PHOSPHORUS (mg/l)	CALCIUM (mg/l)	IRON (μg/l)	SURFACTANT (mg/l)
JULY 79	<1.0	<0.3	<0.2	31.0	<100	NA
OCT 79	<1.0	<0.3	<0.2	28.0	3300	<0.1
APR 80	<1.0	<0.3	<0.2	8.4	<100	<0.1
JULY 80	<1	<0.3	<0.2	1.9	<100	<0.1
JUNE 82	<1	<0.3	<0.1	[illegible]	7784	[illegible]
OCT 82	<1.0	4.3	0.12	29.8	<100	<0.1
JAN 83	NA	2.5	NA	NA		NA
MAR 83	NA	152.0	NA	NA	NA	<0.1
SEPT 83	3.0	0.5	NA	NA	NA	NA

DATE	VOLATILE HALOCARBONS	VOLATILE AROMATICS	OILS AND GREASES	KJELDAHL NITROGEN	ETHYLENE GLYCOL	FECAL COLIFORM	pH	PHE
JUNE 84	0.5 μg/l Methylene Chloride 0.3 μg/l TCE	34 μg/l MEK 1.2 μg/l p-Xylene	<0.3 mg/l	10.5 mg/l	NOT ACCOMPLISHED	10 colonies/100 ml	7.8	<1[illegible]
JULY 84	ND	ND	BIT	2.9 mg/l	LOST IN TRANSIT	2 colonies/100 ml	8.0	<1[illegible]
AUG 84	1,1-Dichloroethane 1.0 μg/l Methylene chloride 0.4 μg/l	NC	1.8 mg/l	1.8 mg/l	26 mg/l	58 colonies/100 ml	8.2	<1[illegible]
Sept.			0.3 mg/l	0.7 mg/l			8.3	20

CHRONOLOGICAL DATA RESULTS - WSA / SALMON RIVER / SW BOUNDARY (0159-NS-804)

DATE SAMPLE TAKEN	TOTAL KJELDAHL NITROGEN (mg/l)	OIL AND GREASES (mg/l)	PHOSPHORUS (mg/l)	CALCIUM (mg/l)	IRON (µg/l)	SURFACTANTS (mg/l)
JULY 79	<1.0	[illegible]	<0.2	18.0	<100	NA
OCT 79	<1.0	<0.3	<0.2	10.0	280	<0.1
APR 80	[illegible]	<0.3	<0.2	3.9	[illegible]	[illegible]
JULY 80	[illegible]	[illegible]	<0.2	[illegible]	[illegible]	[illegible]
JUNE 82	2.0	<0.3	<0.1	40.3	[illegible]	<0.1
OCT 82	<1.0	<0.3	<0.1	34.9	826	<0.1
SEPT 83	<1.0	0.5	NA	NA	NA	NA
	VOLATILE HALOCARBONS	VOLATILE AROMATICS	OILS AND GREASES	FECAL COLIFORM	pH	
JUNE 84	0.5 µg/l Methylene Chloride	ND	<0.3 mg/l	28 colonies/100 ml	7.8	
JULY 84	ND	ND	<0.3 mg/l	10 colonies/100 ml	8.2	
AUG 84	1,2-Dichloroethane 0.5 µg/l Meth. chloride 7.0 µg/l TCE 0.7 µg/l 111-Trichloroethane 0.7 µg/l	Benzene 1.6 µg/l Toluene 5.3 µg/l	<0.3 mg/l	BIT	8.0	
Sept.			3.1 mg/l	65 colonies/100 ml	8.3	

CHRONOLOGICAL DATA RESULTS - MAINTENANCE FACILITIES HOLDING POND (0159-NS-005

	DATE SAMPLE TAKEN	VOLATILE HALOCARBONS	VOLATILE AROMATICS	OILS AND GREASES	KJELDAHL NITROGEN	pH	PHENOL
	JUNE 84	0.2 μg/l TCE	3.9 μg/l MEK	<0.3 mg/l	10.5 mg/l	7.8	<10 μg
	JULY 84	ND	ND	0.8 mg/l	1.3 mg/l	8.0	10 μg/l
	AUG 84	Trans 1,2 Dichloroethene 0.6 mg/l	Ethylbenzene 2.4 mg/l	4.3 mg/l	1.2 mg/l	8.0	<10 mg
		methylene chloride 0.3 mg/l Trichloroethylene 0.3 mg/l					
	Sept.			1.4 mg/l	0.3 mg/l	8.0	24 mg

CHRONOLOGICAL DATA RESULTS - STREAM INFLUENT TO GOLF COURSE - (0159-NS-006)

	DATE SAMPLE TAKEN	VOLATILE HALOCARBONS	VOLATILE AROMATICS	OILS AND GREASES	KJELDAHL NITROGEN	ETHYLENE GLYCOL	FECAL COLIFORM	pH	P
	JUNE 84	0.2 μg/l METHYLENE CHLORIDE	ND	<0.3 mg/l	10.0 mg/l	NOT COLLECTED	10 colonies/100 ml	7.8	<
	JULY 84	ND	ND	5.0 mg/l	0.8 mg/l	<10 mg/l	0 colonies/100 ml	7.6	
	AUG	1,2-Dichloroethane 1.0 μg/l Meth. chloride 1.3 μg/l TCE 0.7 μg/l		< .3 mg/l	6.1 mg/l	<10 mg/l	78 colonies/100 ml	8.0	
	Sept.			4.5 mg/l	5.8 mg/l	<10 mg/l	0 colonies/100 ml	8.3	<

CHRONOLOGICAL DATA RESULTS - STORM DRAIN EFFLUENT (0159-NS-[redacted] 001)

DATE SAMPLE TAKEN	TOTAL KJELDAHL NITROGEN (mg/l)	OIL AND GREASES (mg/l)	PHOSPHORUS (mg/l)	CALCIUM (mg/l)	IRON (µg/l)	SURFACTA[NTS] (mg/l)
OCT 79	<1.0	<0.3	<0.2	27.0	5000	<0.1
APR 80	<1.0	<0.3	<0.2	2.0	<100	0.1
JULY 80	1.0	<0.3	<0.2	2.0	<100	NA
JUNE 82	4.9	18.0	<0.1	53.3	9410	0.1
OCT 82	2.0	~~NA~~ <0.3	0.1	42.7	465	<0.1
OCT 82	<1.0	NA	<0.1	NA	NA	NA
SEPT 83	BIT	0.5	NA	NA	NA	NA

All SAMPLES TAKEN FROM POINT MAY ALSO BE ACQUIRED FROM 0159-NS-002 (TABC). THIS POINT IS APPROX 40 YARDS UP [redacted]STREAM FROM 0159-NS-002, IT IS FELT LITTLE TO NO DEGRADATION WILL OCCUR IN ROUTE AND THAT SAMPLING AT BOTH POINTS MERELY DUPLICAT RESULTS AND EFFECTS. FURTHERMORE, 0159-NS-002 IS EASIER AND QUICKER TO REACH IN ~~NEED~~ CASE OF EMERGENCY SAMPLING REQUIREME

APPENDIX H

Glossary

(Including Acronyms and Abbreviations Used in the Text)

GLOSSARY

List of Acronyms, Abbreviations, and Symbols Used in the Text

AFB	Air Force Base
AFESC	Air Force Engineering and Services Center
AFFF	Aqueous Film Forming Foam
AG	Above Ground
AGE	Aerospace Ground Equipment
AMS	Avionics Maintenance Squadron
ATD	Aircrew Training Devices
AVGAS	Aviation Gasoline
BG	Below Ground
BMW	Bombardment Wing
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CES	Civil Engineering Squadron
DCE	Dichloroethylene
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DLA	Defense Logistics Agency
DOD	Department of Defense
DPDO	Defense Property Disposal Office
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
°F	Degrees Fahrenheit
FMS	Field Maintenance Squadron
gal/yr	Gallons Per Year
HARM	Hazard Assessment Rating Methodology
In.	Inches
IRP	Installation Restoration Program
JP	Jet Petroleum
MEK	Methyl Ethyl Ketone
MMS	Munitions Maintenance Squadron
MOGAS	Motor Gasoline

NDI	Non-destructive Inspection
No.	Number
OMS	Operational Maintenance Squadron
PAFB	Plattsburgh Air Force Base
PCBs	Polychlorinated Biphenyls
PMEL	Precision Measurement Equipment Laboratory
POL	Petroleum, Oil, and Lubricants
ppb	Parts Per Billion
ppm	Parts Per Million
R&D	Research and Development
RCRA	Resource Conservation and Recovery Act
SAC	Strategic Air Command
TCE	Trichloroethylene
TOC	Total Organic Carbon
TSCA	Toxic Substances Control Act
USAF	United States Air Force

AQUIFER - A geologic formation, or group of formations, that contains sufficient saturated permeable material to conduct groundwater to yield economically significant quantities of groundwater to wells and springs.

AQUIFER YIELD - Maximum rate of withdrawal of water from an aquifer.

BEDROCK - Bedrock is the solid rock underlying surficial, unconsolidated earthy materials. Shallow soils are 10 to 20 inches to bedrock; moderately deep soils are 20 to 40 inches to bedrock.

BOULDERS - Rounded or partially rounded rock fragments larger than 24 inches in diameter.

CLAY - Small mineral soil particles less than 0.002 millimeters in diameter. Individual particles cannot be seen with the naked eye.

COARSE TEXTURE - Textures of loamy find sand, loamy sand, and sand.

COBBLES - Rounded or partially rounded rock fragments 3 to 10 inches in diameter.

CONTAMINANT - As defined by section 104(a)(2) of CERCLA, shall include, but not be limited to, any element, substance, compound, or mixture, including disease causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformation in such organisms or their offspring.

DETAILED SOIL MAP - Delineate individual soils, generally at a field scale of about four inches to one mile and a published scale of 1:20,000.

DICHLOROETHYLENE (DCE) - A general solvent for organic materials; dye extraction; perfumes; lacquers; thermoplastics; and organic synthetics.

DISCHARGE - The process involved in the draining or seepage of fluid out of a lake, pipe, groundwater aquifer or similar fluid containing structure.

DOWNGRADIENT - A direction that is hydraulically down slope; the direction in which ground water flows.

EXCESSIVELY DRAINED - A soil drainage class. Water is removed from the soil very rapidly. Most of these soils are very porous, free of mottling throughout the profile, and droughty during dry periods.

FLOOD PLAIN - The relatively smooth valley floors adjacent to and formed by alluviating rivers which are subject to overflow.

FLOODED SOILS - Are inundated with water part or all of the year. Most flooded areas have alluvial or organic soils but some areas of other soils may be flooded for short periods during some wet seasons.

GRAVEL - Rounded or partially rounded rock fragments two millimeters to three inches in diameter. An individual piece is a pebble. The term gravel refers to a mass of pebbles.

GROUND WATER - All subsurface water, especially that part that is in the zone of saturation.

HAZARDOUS WASTE - a solid waste which because of its quantity, concentration, or physical, chemical or infectious characteristics may--

(A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible, illness; or

(B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of, or otherwise managed.

INTERNAL DRAINAGE - That quality of a soil that permits the downward flow of excess water through it. Internal drainage is reflected in the frequency and duration of periods of saturation with water.

LACUSTRINE - Deposits are clayey, silty or fine sandy mineral materials left in relatively still water at the bottom of glacial lakes. Lacustrine soils are soils that have formed in these deposits.

LEACHATE - a solution resulting from the separation or dissolving of soluble or particulate constituents from solid waste or other man-placed medium by percolation of water.

LEACHING - the process by which soluble materials in the soil, such as nutrients, pesticide chemicals or contaminants, are washed into a lower layer of soil or are dissolved and carried away by water.

LINER - a continuous layer of natural or man-made materials beneath or on the sides of a surface impoundment, landfill, or landfill cell which restricts the downward or lateral escape of hazardous waste, hazardous waste constituents or leachate.

LOAM - A soil textural class. The soil material contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

LOAMY SAND - A soil textural class. The soil material contains 70 to 90 percent sand and the percentage of silt plus twice the percentage of clay does not exceed 30.

METHYL ETHYL KETONE - An organic chemical used as a solvent in cements and adhesives.

MIGRATION (Contaminant) - The movement of contaminants through pathways (groundwater, surface water, soil, and air).

MODERATELY WELL DRAINED - A soil drainage class. Water is removed from the soil somewhat slowly. The soil is wet for a short period of time, usually in spring or fall.

NET PRECIPITATION - Mean annual precipitation minus mean annual evapotranspiration.

OIL/WATER SEPARATOR - A man-made facility designed to separate by gravity liquids of differing densities; typically to skim oil or grease from a water surface.

PCB (Polychlorinated Biphenyl) - A chemically and thermally stable toxic organic compound that, when introduced into the environment, persists for long periods of time, is not readily biodegradable, and is biologically accumulative.

PD680 - A petroleum distillate used as a safety cleaning solvent. Two types of PD680 solvent have been used; Type I, having a flashpoint of 100°F, and Type II, having a flashpoint of 140°F.

PERMEABILITY - The capacity of a porous rock, sediment, or soil for transmitting a fluid without impairment of the structure of the medium; it is a measure of the relative ease of fluid flow under unequal pressure.

POORLY DRAINED SOILS - A soil drainage class. Water is removed so slowly that the soil remains wet much of the time. The water is at or near the surface during a considerable part of the year.

PROFILE - A vertical section of the soil through all its horizons and extending into the parent material.

RECHARGE - The process involved in the addition or replenishment of water to a groundwater aquifer by natural or artificial processes.

ROCK - Exposures or outcrops of sandstone, siltstone, shale or limestone.

SAND - Small mineral soil particles that are 0.05 to 2.0 millimeters in diameter. The individual grain can be seen with the naked eye.

SANDY LOAM - A soil textural class. The soil material contains less than 20 percent clay; from 52 to 70 or 85 percent sand, and from 28 to 50 percent silt.

SILT - Small mineral particles that are 0.002 to 0.5 millimeters in diameter. They feel soft and floury.

SILT LOAM - A soil textural class. The soil material contains 50 percent or more silt and 12 to 27 percent clay (or) 50 to 80 percent silt and less than 12 percent clay; with sand content ranging from 0 to 50 percent.

SLOPE - Refers to the incline of the surface of the soil area. It is usually expressed as percent slope.

SOIL - An integral part of the environment composed of discrete bodies produced by interactions of climate and vegetation changing surficial geologic materials in geomorphic landscapes.

SOIL PROFILE - Is the vertical cut or exposure of an individual soil that includes the collection of all the genetic horizons, the natural organic layers of the surface, and the deep geologic layers that influence the genesis and behavior of the soil.

SOIL TEXTURAL CLASSES - Classified as follows:

Sandy soils -	Coarse textured soils--sands, loamy sands.
Loamy soils -	Moderately course textured soils--sandy loam, fine sandy loam
	Medium textured soils--very fine sandy loam, loam, loam silt, silt
	Moderately fine textured soils--clay loam, sandy clay loam, silty clay loam
Clayey soils -	Fine textured soils--sandy clay, silty clay, clay

SOMEWHAT POORLY DRAINED - A soil drainage class. Water is removed from the soil slowly so that the water table remains near the surface for significant periods of time. These soils are usually waterlogged during late fall, winter and early spring.

STONE - Rounded or irregularly shaped angular fragments of rock more than 10 inches in diameter, or thin flat fragments more than 15 inches in length.

STRATIFIED - Layers of contrasting textures, generally horizontally bedded or only slightly sloping.

SURFACE SOIL - The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness.

SURFACE WATER - All water exposed at the ground surface; including streams, rivers, ponds, and lakes.

TEXTURE - The relative amounts of sand, silt, and clay particles in a mass of soil. A mass high in clay has clayey or finer texture and one high in sand has sandy or coarser texture.

TILL - Unsorted and unstratified drift, generally unconsolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier, and consisting of a heterogeneous mixture of clay, sand, gravel, and boulders varying widely in size and shape.

1,1,1-TRICHLOROETHANE (Methyl Chloroform) - A solvent used for cleaning precision instruments, metal degreasing and textile processing.

TRICHLOROETHYLENE (TCE) - A solvent used for metal degreasing; extraction solvent for oils, fats, waxes; solvent dyeing; dry cleaning; refrigerant and heat exchange liquid; fumigant; cleaning and drying electronic parts; diluent in paints and adhesives; textile processing; chemical intermediate; aerospace operations (flushing liquid oxygen).

UPGRADIENT - A direction that is hydraulically up slope.

VERY POORLY DRAINED - A soil drainage class. Water is removed from the soil so slowly that the water table remains at or near the surface most of the time. These soils usually occupy level or depressional areas and are frequently ponded.

WATER TABLE - The upper surface of ground water or the upper limit of the part of the soil or underlying material wholly saturated with water.

WELL DRAINED - A soil drainage class. Water is removed from the soil readily but not rapidly. The soils commonly retain optimum amounts of moisture for most plant growth. They are neither too wet or too dry during the normal growing season.

WET - Used as a general term to designate soils that are not well drained. Wet soils include those that are moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained.

APPENDIX I

References

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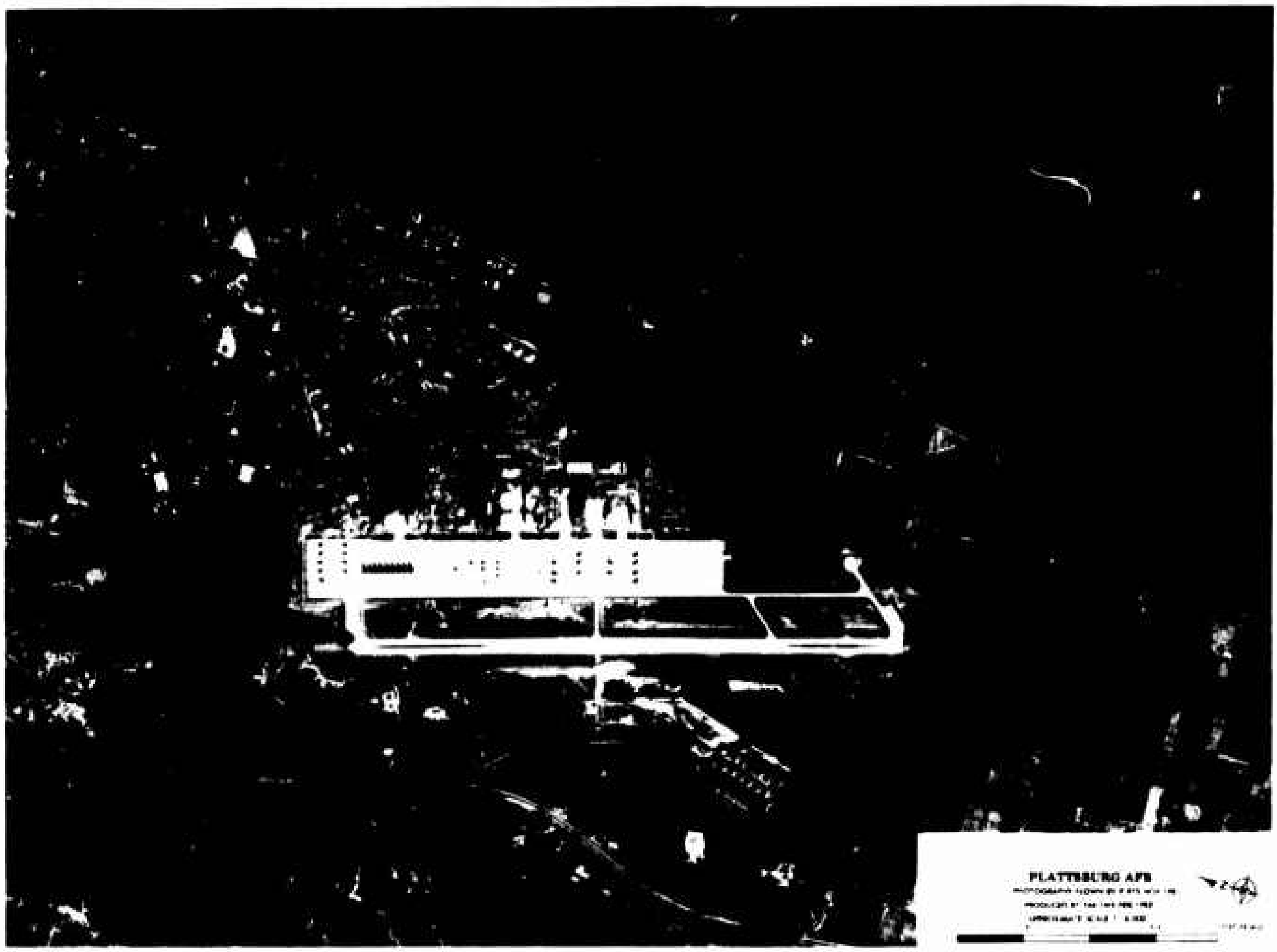
APPENDIX J

Aerial and Ground Photographs
Plattsburgh Air Force Base



AERIAL VIEW OF PLATTSBURGH AIR FORCE BASE
(November 1981)

Lake Champlain is visible at the top, the Saranac River is visible at the left.

Flightline Drainage Channel (view facing southwest)

Channel collects drainage from the flightline ramp. Flow is northeast discharging to the first of three golf course retention ponds.

Flightline Drainage Retention Ponds 1 and 2 (view facing west)

Pond 2 is in foreground; Pond 1 in background. The drainage channel (above) and the first pond are connected by the culvert (on the left) beneath the road entering the golf course.

Flightline Drainage Retention Pond (view facing east)

First pond in foreground followed by second, and third pond in background. Note oil absorbent boom placed at discharge end of second pond.

Industrial Drainage Retention Pond (view facing northeast)

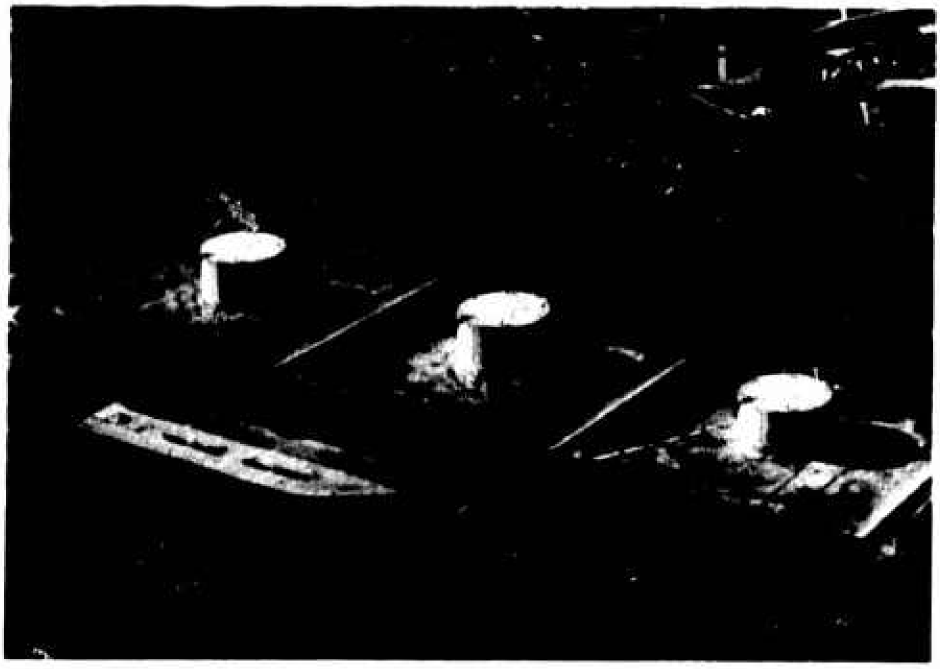
Pond in foreground is first of two ponds treating drainage from industrial areas adjacent to flightline ramp. Second pond is visible beyond concrete dam. Note oil absorbent boom in place on concrete dam.

Industrial Drainage Retention Pond 2 (view facing east)

Second industrial drainage pond with concrete abutments to prevent damage to banks from erosion. Note oil absorbent boom in background at discharge point of pond.

Oil Absorbent Boom (view facing north)

Oil absorbent boom similar to ones used on base to collect surface oil, solvent, or fuel residuals on drainage streams. Note collection of floatables upstream of oil boom. Source of flow is the second industrial drainage pond (above); flow is from the left.



Aerial View of POL Storage Yard (view facing southwest)

The JP-4 fill stands are visible to the lower left of the tanks. The drainage stream (not shown) is located to the lower right.

Aerial View of Active Fire Training Area (view facing east)

The two bentonite lined pits are visible, the inactive unlined pit (not shown) is located to the left.

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